I would like to install MDC-Max but I know there will be resistance from the shop floor.

One of the early successes was a shop that was not reaching production targets. The production manager was being pushed to increase production. He had already reported problems with several of the machines that made it impossible to reach the targets, but nothing had been done. Two weeks after installation the production manager met with the management, and the MDC-Max figures showed conclusively that two machines were indeed causing the backlog in production.

The machines were bar-fed machines, and the company had switched to a less expensive material supplier, but these bars were constantly sticking and jamming the machines causing lost production. MDC-Max highlighted this problem and the company changed back to their original supplier.

Often shop floor staff is suspicious of monitoring systems as they see them as "big brother" watching them. However, the staff can actually benefit from MDC-Max, since it can highlight problems that have been apparent to them for some time, but of which they have been unable to convince the management.

Recently MDC-Max was installed at a company that was not reaching production targets. The production manager was being pushed to increase production. He had already reported problems with several of the machines that made it impossible to reach the targets, but nothing had been done. Two weeks after installation the production manager met with the management, and the MDC-Max figures showed conclusively that two machines were indeed causing the backlog in production.

The machines were bar-fed machines, and the company had switched to a less expensive material supplier, but these bars were constantly sticking and jamming the machines causing lost production. MDC-Max highlighted this problem and the company changed back to their original supplier.

Often shop floor staff is suspicious of monitoring systems as they see them as "big brother" watching them. However, the staff can actually benefit from MDC-Max, since it can highlight problems that have been apparent to them for some time, but of which they have been unable to convince the management.

Recently MDC-Max was installed at a company that was not reaching production targets. The production manager was being pushed to increase production. He had already reported problems with several of the machines that made it impossible to reach the targets, but nothing had been done. Two weeks after installation the production manager met with the management, and the MDC-Max figures showed conclusively that two machines were indeed causing the backlog in production.

The machines were bar-fed machines, and the company had switched to a less expensive material supplier, but these bars were constantly sticking and jamming the machines causing lost production. MDC-Max highlighted this problem and the company changed back to their original supplier.

Often shop floor staff is suspicious of monitoring systems as they see them as "big brother" watching them. However, the staff can actually benefit from MDC-Max, since it can highlight problems that have been apparent to them for some time, but of which they have been unable to convince the management.
CIMCO MDC-Max was recently installed at a customer site that had tooling cost issues. The production director had only recently taken over the management of the shop floor and felt that the tooling costs were too high.

CIMCO MDC-Max was installed and collecting data before the night shift arrived. The next morning the production director checked the monitoring data collected from the machines and immediately had his answer. The night shift cycle times for 4 machines were 30% less than the cycle times during the day and the same machines were stopped for over an hour at the end of the shift. The operators had turned up the feed rates, but the increased feed rates resulted in poor tool tip life and increased tooling costs. The customer now has reduced tooling costs while still achieving the same production schedules and said that the system will pay for itself in a matter of months.

A large aerospace contractor was concerned that their production was not keeping up with demand and had made the decision to buy several additional machines. It was suggested that they check the runtime clocks on the machines for a week to see how much production time was being achieved. They were astonished to find that their machine utilization was below 50% but could not get an accurate picture of why this was happening.

CIMCO MDC-Max was installed to monitor the machines along with bar code readers for the operators to swipe downtime codes. MDC highlighted several problems in production, two of which were poor maintenance response and failure to replace tooling quickly enough to get the machine back in production.

Following the MDC-Max installation the customer implemented several measures including a priority system for maintenance and availability of new pre-set tools. They now achieve overall machine utilization of over 68% and meet their production targets which has increased profitability so they can now invest in a new plant.
**HOW DOES IT WORK?**

**DATA COLLECTION**

When we talk about data what we actually mean is events. The first task when installing CIMCO MDC-Max is to consider what machine and operator events you want to collect information about.

Machine events can be collected automatically by CIMCO MDC-Max and most installations will include events such as Cycle Start, Cycle Stop, and Part Complete as a minimum. When these events occur at a machine CIMCO MDC-Max is automatically notified and data about the event is stored.

Operator event data is sent manually by machine operators. Using a smartphone, tablet, barcode scanner or PC an operator at a machine can send status information to CIMCO MDC-Max indicating specific events. Usually you want to collect downtime reasons such as Waiting for Setup, Waiting for Maintenance, Scrapped Part, Inspection, etc. CIMCO MDC-Max can be customized to collect specific information on any event.

When we talk about data what we actually mean is events. The first task when installing CIMCO MDC-Max is to consider what machine and operator events you want to collect information about.

Machine events can be collected automatically by CIMCO MDC-Max and most installations will include events such as Cycle Start, Cycle Stop, and Part Complete as a minimum. When these events occur at a machine CIMCO MDC-Max is automatically notified and data about the event is stored.

Operator event data is sent manually by machine operators. Using a smartphone, tablet, barcode scanner or PC an operator at a machine can send status information to CIMCO MDC-Max indicating specific events. Usually you want to collect downtime reasons such as Waiting for Setup, Waiting for Maintenance, Scrapped Part, Inspection, etc. CIMCO MDC-Max can be customized to collect specific information on any event.

**ADVANCED SETUP FOR MACHINE DATA COLLECTION**

The majority of companies only want to know if a particular machine is running and producing parts or if it is stopped. With a basic data collection setup MDC-Max can show the amount of time the machine has been in production and the amount of time allocated to downtime.

With the advanced data collection option MDC-Max can provide accurate reporting of machine tool efficiency on any job. MDC-Max can show the total percentage of downtime for each type of machine stoppage such as Tooling, Setup, Machine Maintenance, etc. This additional information is provided by the operator using a tablet or a barcode scanner. The operator uses the tablet or simply scans a barcode to indicate the downtime reason. This information can then be used to pinpoint exactly what is causing a loss of production.
LIVE SCREENS SHOWING REAL-TIME MACHINE STATUS

SEE MACHINE STATUS FROM ANYWHERE WITH THE MDC-MAX WEB CLIENT ON MOBILE DEVICES

REAL-TIME MONITORING

One of the unique features of CIMCO MDC-Max is our Live Screen which provide a great status overview for every machine and can be displayed on large plasma or LCD screens. This Live Screen can be configured to show a list of all machines and their current status. Further, data such as machine name, job name, part count, running time, downtime, etc. can be associated with each machine to provide a complete overview.

The Live Screen is normally displayed on large screens that are installed in convenient locations so that all personnel can easily see the status of each machine. However, it can also be displayed on smartphones, tablets, and touch screens using the MDC-Max Web Client and can thereby be viewed from anywhere there is an internet connection.

If machines are running unattended MDC-Max can even be configured to send an email and a text message to a standby operator’s or supervisor’s smartphone if a machine stops.

REPORTS AND GRAPHS

In CIMCO MDC-Max data is structured and visualized as reports. You can setup MDC-Max to generate both real-time and historic reports based on the data collected. MDC-Max features a modern tabbed interface where each open report is shown in a separate tap. This maximizes screen space for each report while allowing many reports to be open and updating in the background.

MDC-Max comes with built-in reports, but the true power lies in its ability to create customized reports. Visualize data as tables, pie or bar charts, add in production targets, work shifts, calculate key performance indicators such as OEE, MTBF, MTTR, and more. You can also generate event logs chronologically by operator, machine, and job to know exactly how each machine and operator is performing.

MDC-Max supports dynamic reporting where data is updated in real-time. Machine status can be visualized as timelines or Gantt charts with status changes shown with different bar colors so you can see at a glance what is going on.

DATA IS ANALYZED AND PRESENTED AS REPORTS IN THE CIMCO MDC-MAX CLIENT

EXAMPLES

Cycle time per part (min, max and average)
Number of parts per shift/operator
Number of scrapped parts
Machine downtime
Scheduled maintenance
Unscheduled maintenance
Setup time per part
Operator effectiveness
Overall Equipment Effectiveness (OEE)
Mean time between failures (MTBF)
Mean time to repair (MTTR)
Mean time to repair (MTTR)

Hourly machine utilization
Utilization by cycle time, duration and deviation
Real-time machine status
Live screen positioned to be viewable by the entire shop
Machine utilization visualized as timeline
Productivity summary chart
Utilization and downtime combined
CIMCO MDC-MAX SERVER
DYNAMIC REPORTS SHOW MACHINE STATISTICS IN REAL-TIME
CIMCO MDC-MAX

PRODUCTIVITY SUMMARY CHART

Cycle time per part (min, max and average)
Number of parts per shift/operator
Number of scrapped parts
Machine downtime
Scheduled maintenance
Unscheduled maintenance
Setup time per part
Operator effectiveness
Overall Equipment Effectiveness (OEE)
Mean time between failures (MTBF)
Mean time to repair (MTTR)

Cycle time per part (min, max and average)
Number of parts per shift/operator
Number of scrapped parts
Machine downtime
Scheduled maintenance
Unscheduled maintenance
Setup time per part
Operator effectiveness
Overall Equipment Effectiveness (OEE)
Mean time between failures (MTBF)
Mean time to repair (MTTR)
**HANDHELD OPTIONS**

**MDC-MAX WEB CLIENT**

With the MDC-Max Web Client we have taken operator events to the next level. The web client can display your live screens and be customized to send any operator event you can think of. Machine status and operator events can be accessed directly in the web client interface making it extremely easy for operators to send downtime reasons for a specific machine.

The web client is optimized for even the smallest displays using responsive design techniques. This means you can access the same interface on smartphones, tablets, and PCs. Thereby the traditional operator screen at the machine has become mobile and can fit in every operator’s pocket. This is not only convenient for the operator, but also a cost-efficient alternative to having client PCs or barcode readers installed at each machine.

**DNC-MAX WEB CLIENT**

CIMCO’s innovative DNC software includes a new web client that can be accessed from any mobile device or PC.

The DNC-Max Web Client can display the current program transfer progress and state of all your machines. You can send, receive, and preview CNC programs using a built-in file browser showing your files on the DNC-Max Server - just like with our regular DNC-Max PC client. It is even possible to stop transmission of programs, restart ports, and also remove programs from the transmission queue directly from the web interface.

Please contact us for more information about how CIMCO DNC-Max can seamlessly integrate with your MDC-Max solution.

**SYSTEM INTEGRATION**

**EXCEL**

**ERP/MPS SYSTEMS**

**CIMCO**

**EXTEND WITH CIMCO SOFTWARE**

CIMCO MDC-Max can be fully integrated with CIMCO DNC-Max, CIMCO NC-Base and CIMCO MDM giving you a complete DNC, manufacturing data management, and machine data collection system from one supplier.

CIMCO DNC-Max controls CNC program transfer to all of your machines. Programs can be requested directly from the machine control – operators do not need to leave the control to download programs. A program that is changed and uploaded by the operator can automatically become the active version of the program while storing the previous version as a backup copy of the file or the uploaded file can be stored in a quarantine area. This offers the ability to track changes and revert to any previous version if necessary.

CIMCO NC-Base and CIMCO MDM are both full featured manufacturing data management systems that help you manage, control and securely store your manufacturing related data. While CIMCO NC-Base is ideal for handling your NC-programs and related documents, CIMCO MDM can be customized to handle any kind of data such as CAD/CAM programs and any related documents.

Please contact us for more information about our other software products or learn more at CIMCO.COM.
NETWORK OPTIONS

CIMCO MDC-Max can easily be added to your existing network supporting a variety of hardware options including serial wiring, Ethernet or a wireless networking. MDC-Max collects information from machines connected to your network either directly or using additional hardware. The data collection method depends on your specific type of machine and its monitoring capabilities.

DIRECT CONNECTION

If the machine you wish to monitor has one of the data collection interfaces available (see table below), a direct connection can be achieved by simply connecting an Ethernet cable to the machine. In this case no additional hardware is required beyond what might be needed for operator input (e.g. tablet). However, it can be costly to activate or install the monitoring feature if not enabled on a machine control and the option below might be preferred.

HARDWARE CONNECTION

If your machine does not support one of the monitoring interfaces signals can be acquired from the machine using an input device such as the MDC-Box or Moxa ioLogik device. These devices handle the connection between your machine and network and facilitate signal transmission, in the form of machine event data, to MDC-Max.

SUPPORTED MACHINE CONTROLS

The machine controls listed are just some of the many controls we support for direct connection. If your control is not listed please contact us for information about your specific machine and control.

<table>
<thead>
<tr>
<th>Control</th>
<th>Required interface</th>
<th>Extent of data access</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Fanuc</td>
<td>FOCAS</td>
<td>Full compatibility</td>
<td></td>
</tr>
<tr>
<td>Haas</td>
<td>M-Net</td>
<td>Full compatibility</td>
<td></td>
</tr>
<tr>
<td>Mazak</td>
<td>MTConnect</td>
<td>Full compatibility</td>
<td></td>
</tr>
<tr>
<td>Okuma</td>
<td>MTConnect</td>
<td>Full compatibility</td>
<td></td>
</tr>
<tr>
<td>Mitsubishi</td>
<td>MTConnect</td>
<td>Full compatibility</td>
<td></td>
</tr>
<tr>
<td>NUM</td>
<td>MTConnect</td>
<td>Full compatibility</td>
<td></td>
</tr>
<tr>
<td>Heidenhain</td>
<td>DNC Opt #18</td>
<td>Full compatibility</td>
<td></td>
</tr>
<tr>
<td>Siemens (840D, 810D)</td>
<td>Hardware adapter</td>
<td>Most compatibility</td>
<td></td>
</tr>
</tbody>
</table>

We are continuously adding support for additional machines.

ETHERNET NETWORK

Many manufacturing facilities are networked, with Ethernet available at each machine. Standard Ethernet hardware (switches, routers, bridges, etc.) are used to connect the machines to the network.

TRADITIONAL NETWORK

In a traditional cabled network serial cables can be run from each machine to a single PC and be connected using a Multiport Communications Card installed in the PC. However, we typically advice to use an Ethernet to RS-232 Port Server instead for connecting PC and machines. This solution is more scalable and modern compared to using a multiport card.

WIRELESS NETWORK

Wireless networks on the shop floor are becoming increasingly popular. If you expect to move or add machines a wireless network eliminates the need to run or re-route cables.
"I WOULD LIKE TO INSTALL MDC-MAX BUT I KNOW THERE WILL BE RESISTANCE FROM THE SHOP FLOOR"

Often shop floor staff is suspicious of monitoring systems as they see them as “big brother” watching them. However, the staff can actually benefit from MDC-Max, since it can highlight problems that have been apparent to them for some time, but of which they have been unable to convince the management.

Recently MDC-Max was installed at a company that was not reaching production targets. The production manager was being pushed to increase production. He had already reported problems with several of the machines that made it impossible to reach the targets, but nothing had been done. Two weeks after installation the production manager met with the management, and the MDC-Max figures showed conclusively that two machines were indeed causing the backlog in production.

The machines were bar fed machines, and the company had switched to a less expensive material supplier, but these bars were constantly sticking and jamming the machines causing lost production. MDC-Max highlighted this problem and the company changed back to their original supplier.