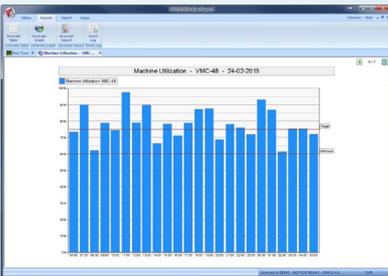
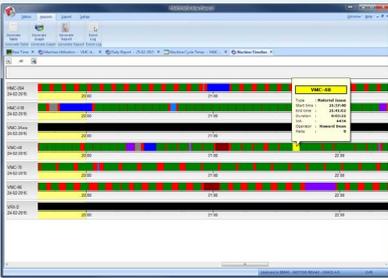


# CIMCO MDC-MAX

COLLECTS AND ANALYSES SHOP FLOOR PRODUCTIVITY



# INCREASE PRODUCTIVITY

WHETHER YOU WANT PRODUCTIVITY BACK UP OR TO INCREASE YOUR EXISTING LEVEL OF PRODUCTIVITY CIMCO MDC-MAX IS THE SOLUTION OF CHOICE

Production is not flowing as it should. You have problems keeping up with demand, too much is going to waste, too much machine downtime, tooling costs are too high and you have no real idea what to change or where to start.

Problems like these can be complicated to solve and often many factors are part of a problem. You might be forced to analyse your entire production in order to know what causes a specific problem. What you end up with will be a snapshot of your production and will require hours or even days of work.

With CIMCO MDC-Max you get the full insight on your production. You get real-time monitoring of your entire production and every second is recorded so you can easily dig into the data and pinpoint those bottlenecks. It's like analysing your entire production every second. Now you can see the source of your problem directly and you can prioritize what changes need to be made in order to solve it.

## A COMPLETE MDC SOLUTION

CIMCO MDC-Max is a complete MDC solution that suits everyone from the one man operation with a few machines to the corporate enterprise with multiple factories. The MDC-Max software is highly flexible and is easily customized to fit your current and future needs for data collection.

CIMCO MDC-Max analyses all the data it collects and can present a variety of statistics and reports as well as feed status information directly to smartphones, tablets and TV-screens for real-time monitoring of your production. Since MDC-Max is a networked solution that stores data on a central server you can monitor production from multiple locations and access the data from anywhere.

# WHY INVEST

## MANUFACTURING PROBLEM FOUND WITHIN 24 HOURS OF INSTALLATION

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 completed 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 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 feedrates so they could take a break at the end of their shift. But the increased feedrates 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 says that the system will pay for itself in a matter of months.

## CIMCO MDC-MAX TRACKS REASONS FOR MACHINE DOWN TIME

At a large Aerospace contractor they were concerned that their production was not keeping up with demand and had made the decision to buy several additional machines. They were suggested to 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 utilisation 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 utilisation 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?

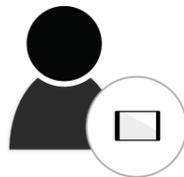
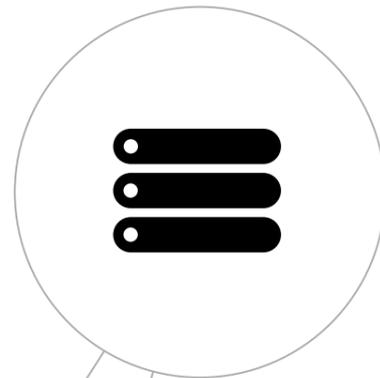
## DATA COLLECTION

When we talk about data what we actually mean is events. So 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.

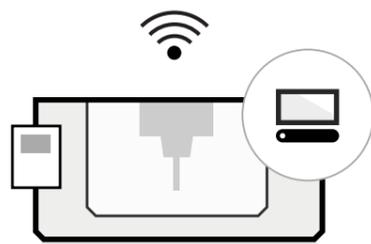
Operator event data is sent manually by machine operators using an input device such as a touch screen by the machine. The operator can send status information to CIMCO MDC-Max indicating specific events and usually you want to collect downtime reasons such as Waiting for Setter, Waiting for Maintenance, Scrapped Part, Inspection, etc. CIMCO MDC-Max can be customized to collect information on any event and a variety of input options are available including smartphone, tablet, touch screen, barcode reader and PC.

ALL EVENT DATA  
SECURELY STORED ON SERVER

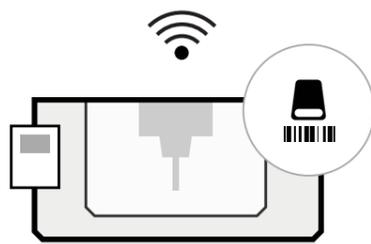


MACHINE AND OPERATOR EVENTS ARE SENT TO SERVER USING NETWORK

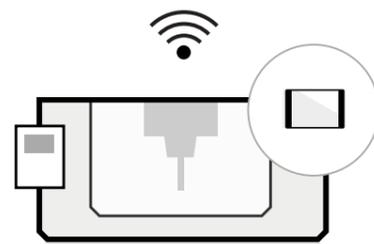
OPERATOR WITH MOBILE DEVICE USING WEB CLIENT FOR FEEDBACK



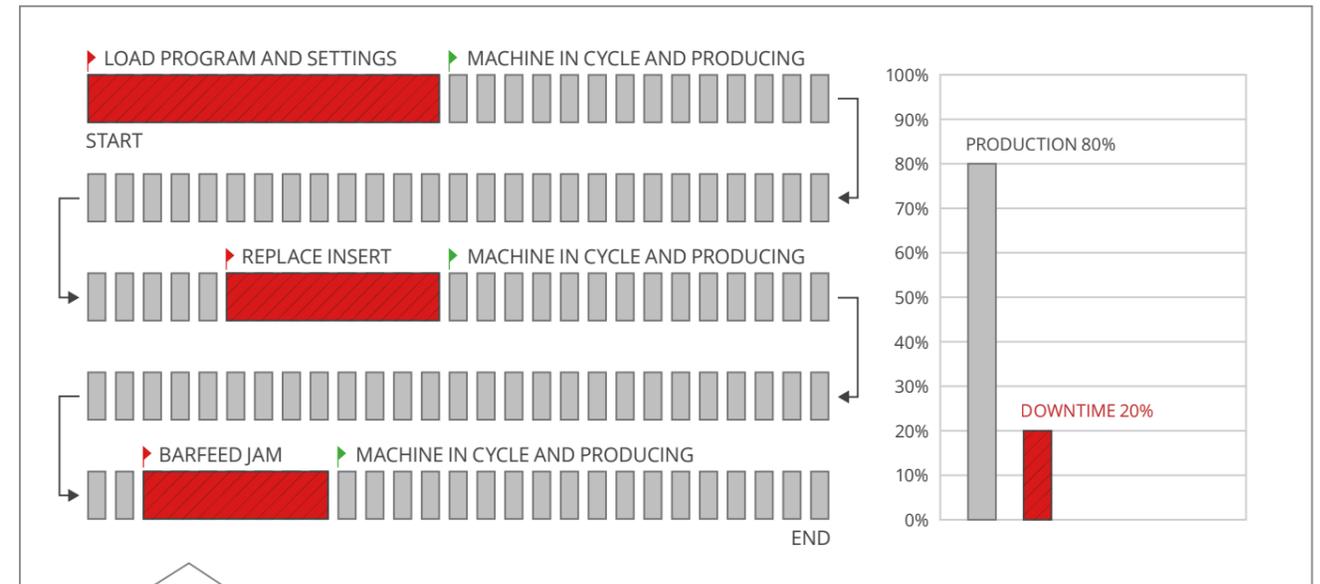
MACHINE #1 EQUIPPED WITH MINI PC FOR OPERATOR FEEDBACK



MACHINE #2 EQUIPPED WITH BARCODE READER FOR OPERATOR FEEDBACK



MACHINE #3 EQUIPPED WITH TABLET FOR OPERATOR FEEDBACK

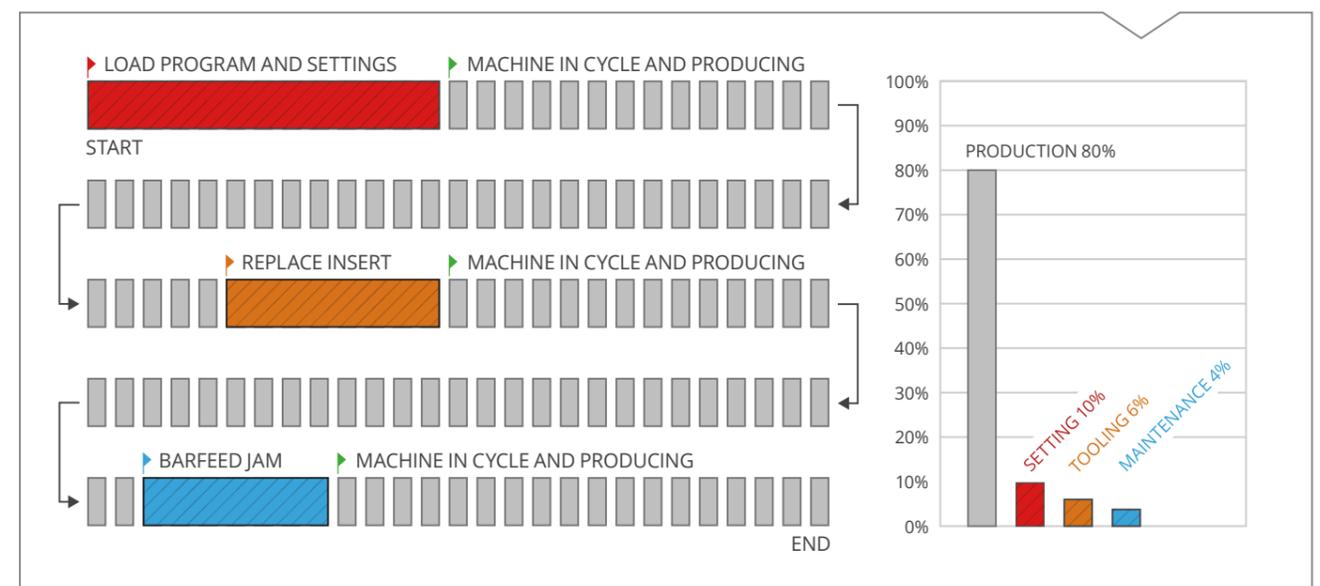


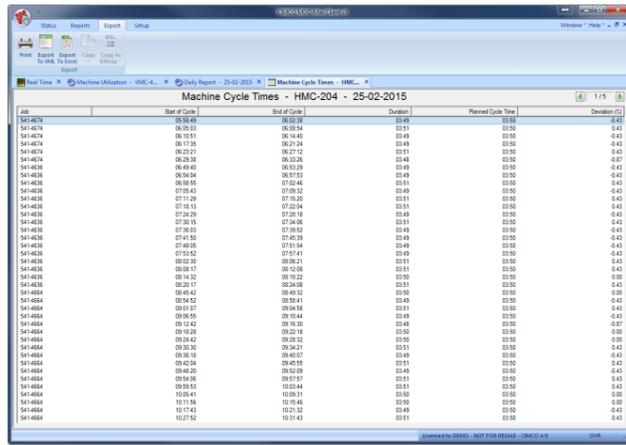
## BASIC SETUP FOR MACHINE DATA COLLECTION

The majority of companies only want to know if a particular machine is running and producing 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. It is then up to the supervisor to ask the operator why the machine was not running.

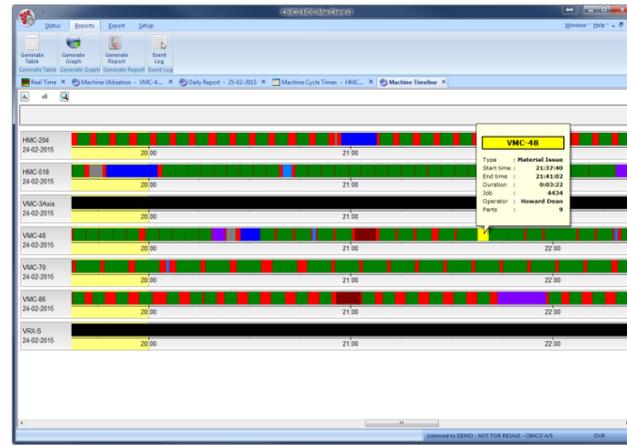
## ADVANCED SETUP FOR MACHINE DATA COLLECTION

With an advanced data collection setup MDC-Max can provide accurate reporting of the machine tool efficiency on any job. MDC-Max can show the total percentage of downtime for each type of machine stoppage such as Tooling, Setting and Machine Maintenance, etc. This additional information is provided by the operator using an input device such as a touch screen. The operator simply enters the specific downtime reason and this information can then help pinpoint what is causing a loss of production.





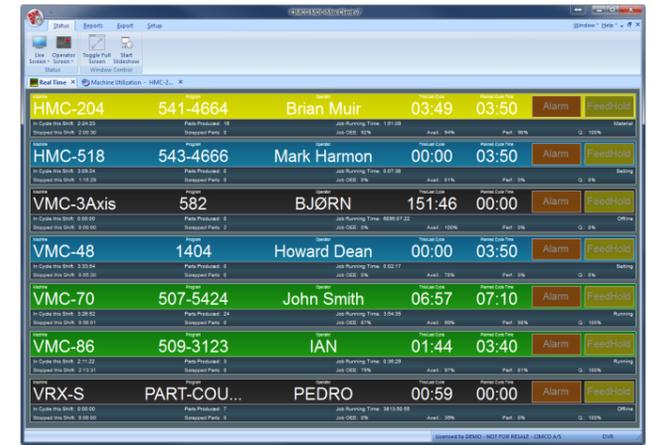
Utilization by cycle time, duration and deviation



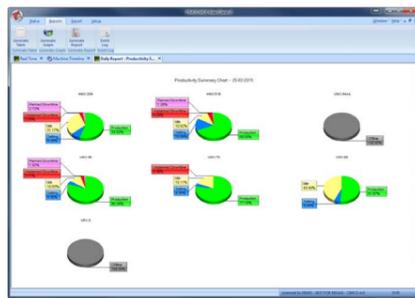
Machine utilization visualized as timeline



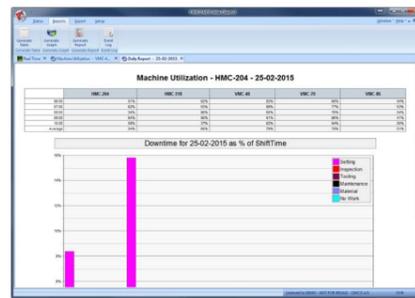
Live Screen positioned where everyone can see it



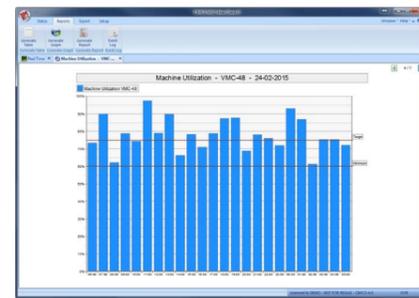
Real-time machine status



Productivity summary chart



Utilization and downtime combined



Hourly machine utilization

## 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 report you open is shown in a separate tab. This maximises screen space for each report while you can have many reports open and running in the background.

MDC-Max comes with built-in reports, but the true power lies in its ability to create customized reports. Visualise 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 in time order by Operator, Machine, and Job to know exactly how each machine and operator is performing.

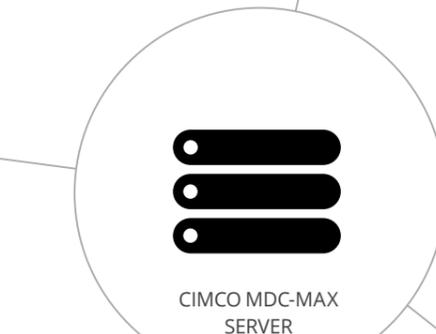
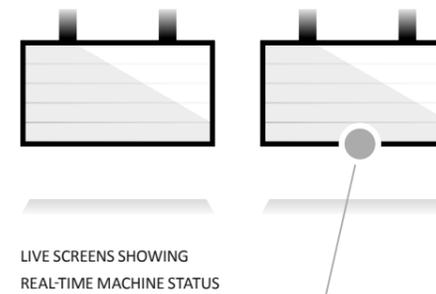
MDC-Max supports dynamic reports where data is updated in realtime. Visualise machine status as timelines or Gantt graphs and have status changes shown with different bar colours so you can see at a glance what is going on.



DATA IS ANALYSED 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)



## REAL-TIME MONITORING

One of the unique features of CIMCO MDC-Max is the Live Screen that can be displayed on large screen TVs to provide a great overview of the status of every machine. The 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 through the night MDC-Max can even be configured to send an email and a text message to a stand-by operator at home in case a machine stops.



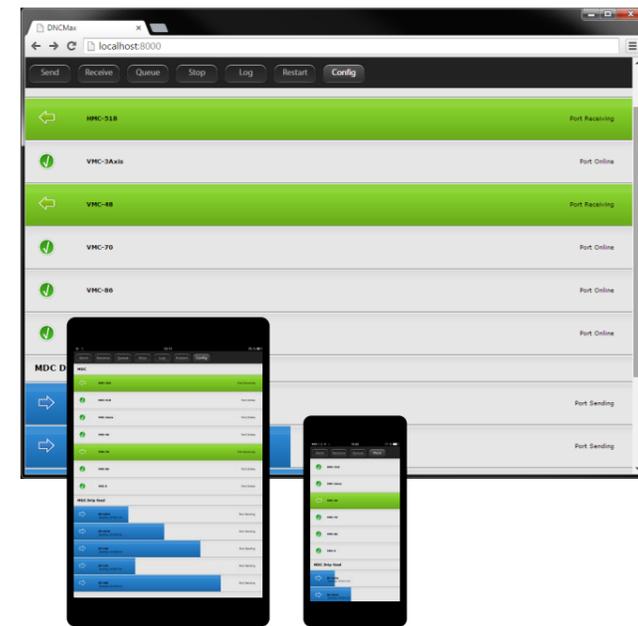
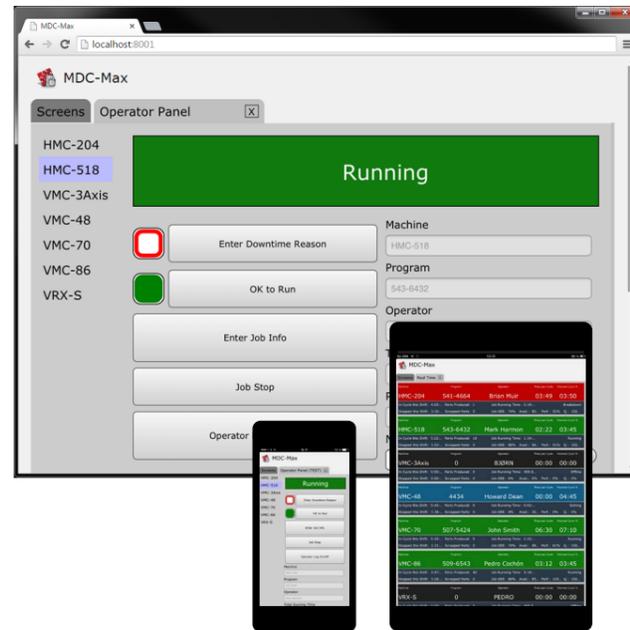
SEE MACHINE STATUS FROM ANYWHERE WITH THE MDC-MAX WEB CLIENT ON MOBILE DEVICES

# 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 to fit well even on 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 mini PCs or bar code readers installed at each machine.



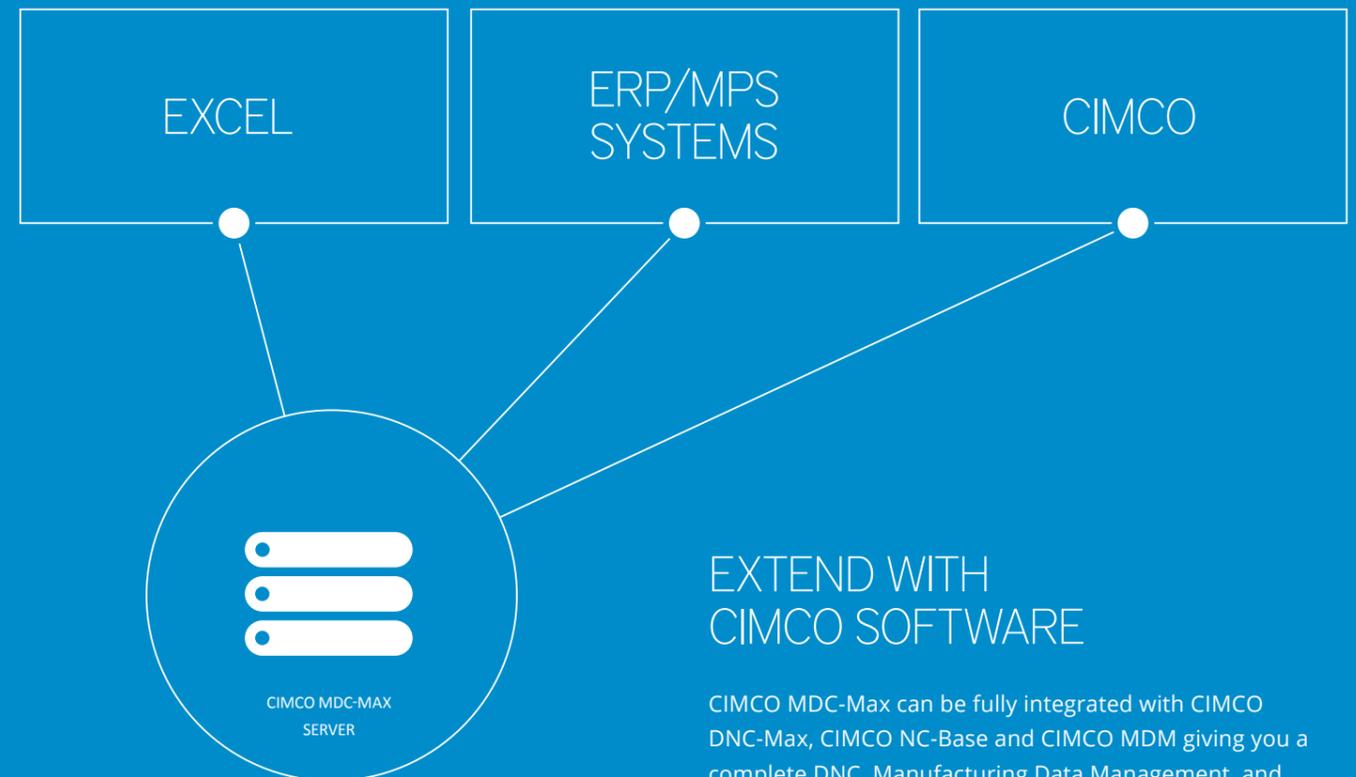
## DNC-MAX WEB CLIENT

For our leading DNC software we also offer a 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 extend your MDC-Max solution.

# SYSTEM INTEGRATION



## 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 the sending and receiving of CNC programs to your range of machines. Programs can be requested directly from the machine control, thus avoiding the operator having to leave his machine. Any program changed by the operator can be automatically raised in version or stored in a quarantine area. This gives you 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.

## INTEGRATION WITH OTHER SYSTEMS

CIMCO MDC-Max comes with full support for Microsoft Excel spreadsheets. This means reports can be exported easily for further analysis in Excel. MDC-Max can even update your Excel spreadsheet automatically, so you always have the latest data available.

CIMCO MDC-Max can also be integrated with most ERP/MPS systems on the market. This means you can have a completely integrated solution that can significantly reduce administrative tasks.

Please contact us for more information about how CIMCO MDC-Max can be integrated with your software systems.

Please contact us for more information about our other software products or learn more at [CIMCO.COM](http://CIMCO.COM).

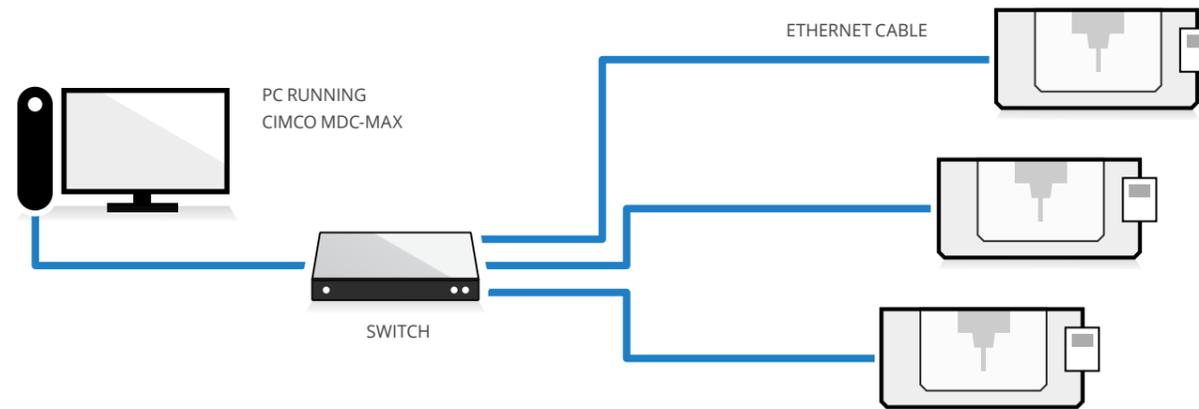
# NETWORK OPTIONS

MDC-Max can easily be added to your existing network whether it is serial cabling, Ethernet or a wireless network. For MDC-Max to monitor a specific machine this needs to be connected to your network either directly or using

additional hardware. How the machine can be connected depends on your specific type of machine and its monitoring capabilities.

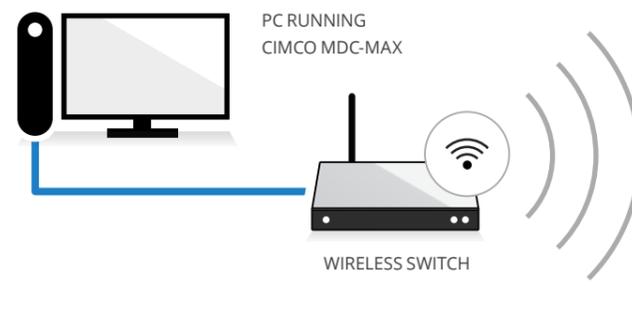
## DIRECT CONNECTION

If monitoring capabilities are available, in the machine you wish to monitor (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, besides 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 by default in the machine control and the option below might be preferred instead.



## HARDWARE CONNECTION

If no monitoring capabilities are available the monitoring signals can be "pulled out" of the machine and connected to an input device such as the MDC-Box or Moxa ioLogik. These devices handle the connection between your machine and network and take care of transmitting the signals (machine events) back to MDC-Max.



## ETHERNET NETWORK

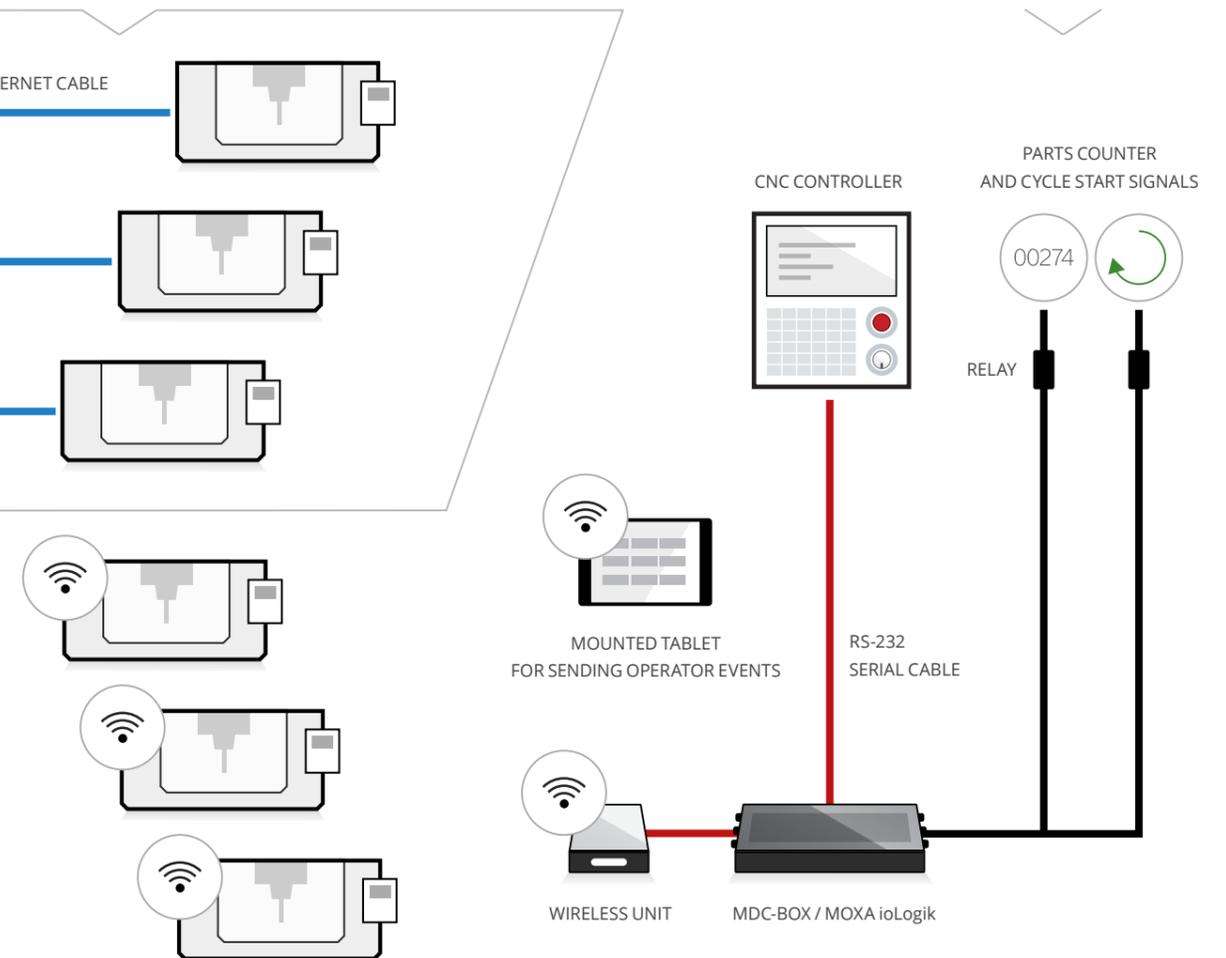
Many companies have an Ethernet Network on the shop floor where an Ethernet cable is run to each machine and standard Ethernet hardware (switches, routers, bridges, etc.) is used to connect the Machines to the PC network.

EXAMPLE OF ETHERNET NETWORK WITH DIRECT CONNECTION TO MACHINES

## WIRELESS NETWORK

Wireless networks on the shop floor are becoming increasingly popular. If you are moving machines around or expect to add new machines a wireless network can be the best solution since you avoid having to deal with cables.

EXAMPLE OF WIRELESS NETWORK WITH HARDWARE CONNECTION USING MDC-BOX / MOXA ioLogik



## SUPPORTED MACHINE CONTROLS

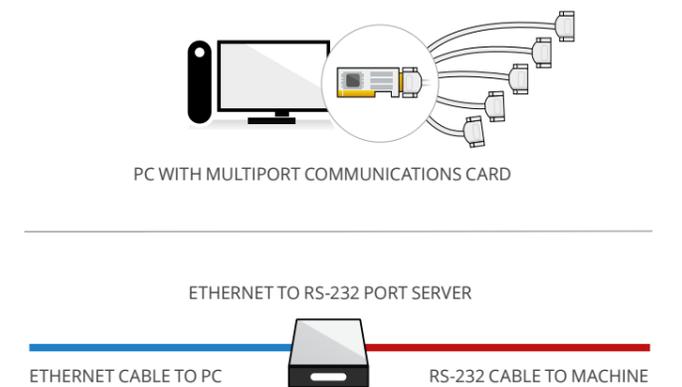
The machine controls listed here are just some of the many controls we support for direct connection. If your control is not listed please contact us for information about your specific machine and control.

Control	Required interface	Extent of data access
Fanuc	FOCAS	Full compatibility
Haas	M-Net	Full compatibility
Mazak	MTConnect	Full compatibility
Okuma	MTConnect	Full compatibility
Mitsubishi	MTConnect	Full compatibility
NUM	MTConnect	Full compatibility
Heidenhain	DNC Opt #18	Full compatibility
Siemens (840D, 810D)	Hardware adapter	Most compatibility

We support a large number of controls. Contact us for more information.

## 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.



# HELPS EVERYBODY IN THE COMPANY

“ I WOULD LIKE TO INSTALL MDC-MAX  
BUT I KNOW THERE WILL BE RESISTANCE FROM THE SHOP FLOOR ”

Many shop floor staff are suspicious of monitoring systems as they see it as “big brother” watching them trying to get them to work harder. 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.

We installed MDC-Max at a company that was not hitting production targets, and where the production manager was being pushed to increase production. He had already reported problems with several of the machines that made

it impossible to hit the targets, but nothing had been done. Two weeks after installation the production manager sat down with the MD, and the MDC-Max figures showed conclusively that two machines were indeed causing the backlog in production.

The machines in question were bar fed machines, and the company had switched to a cheaper material supplier, but the 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.

## CIMCO.COM

VISIT OUR WEBSITE FOR MORE INFORMATION ABOUT  
CIMCO MDC-MAX AND OUR OTHER SOFTWARE PRODUCTS

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