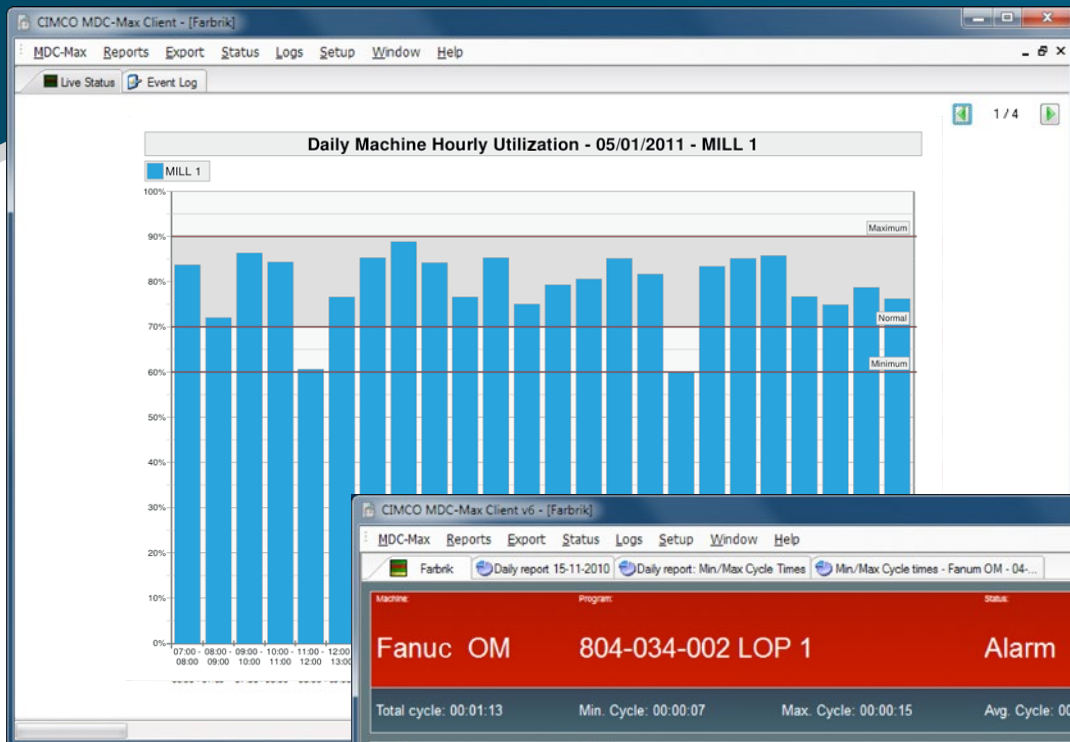


# CIMCO MDC-Max

## The Professional Choice for Manufacturing Data Collection



Machine	Program	Status	Cycle
Fanuc OM	804-034-002 LOP 1	Alarm	00:00:15
Total cycle: 00:01:13    Min. Cycle: 00:00:07    Max. Cycle: 00:00:15    Avg. Cycle: 00:00:12    Count: 6			
Haas	804-03-034 ITEM 1 OP 2	Idle	00:00:15
Total cycle: 00:01:11    Min. Cycle: 00:00:06    Max. Cycle: 00:00:15    Avg. Cycle: 00:00:11    Count: 6			
Mazak M32	NONE	Running	00:00:01
Total cycle: 00:01:11    Min. Cycle: 00:00:06    Max. Cycle: 00:00:15    Avg. Cycle: 00:00:11    Count: 6			
Okuma OSP	TEST-131010	Running	00:00:01
Total cycle: 00:01:13    Min. Cycle: 00:00:06    Max. Cycle: 00:00:15    Avg. Cycle: 00:00:12    Count: 6			

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# CIMCO MDC-Max

## Manufacturing Data Collection

## Make informed decisions

CIMCO MDC-Max is a real-time software machine tool data collection system that gives you instant reports and charts about your shop floor productivity. MDC-Max makes your decisions easy as they will be based on accurate data collected from your machine tools.

In today's complex and competitive global markets, it is more important than ever to maximize effective use of manufacturing equipment. CIMCO MDC-Max provides powerful machine data collection and analysis capabilities to make this task easier and gives you real-time reports including Overall Equipment Effectiveness (OEE).

All of this can be achieved without having to place a PC next to each machine tool – all the data can be collected by cable, wireless, or ethernet (network) and is stored centrally even if you have multiple workshops to monitor.

CIMCO MDC-Max integrates with the latest version of the most trusted CNC-Communication software on the market – CIMCO DNC-Max.

## How MDC-Max works

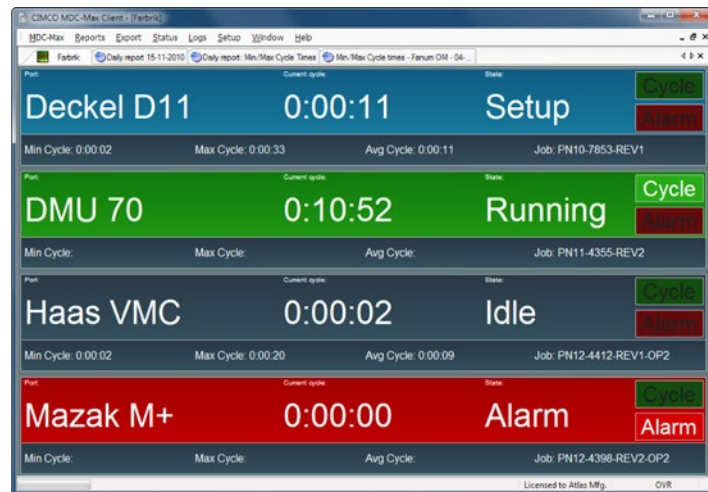
On a typical installation we fit one of our MDC units into the machine control. This unit is wired into the Cycle Start and Parts Counter relays. Every time the machining cycle or the parts counter signal is detected by the MDC unit, a code is sent back to the MDC-Max software. Because of the variety of types of machine controls the monitored signals may vary depending on customers' requirements.

These codes are recorded in real-time on the computer system and can be displayed immediately in a graphical format.

If a machine is not in production for any reason the operator can scan a bar code to let the MDC-Max system know why the machine has stopped. These codes can be customised to suit your company, but typical bar codes would be for recording the following cases:

- Waiting for Setter
- Waiting for Maintenance
- Waiting for Tooling
- Waiting for Material
- Waiting for ...

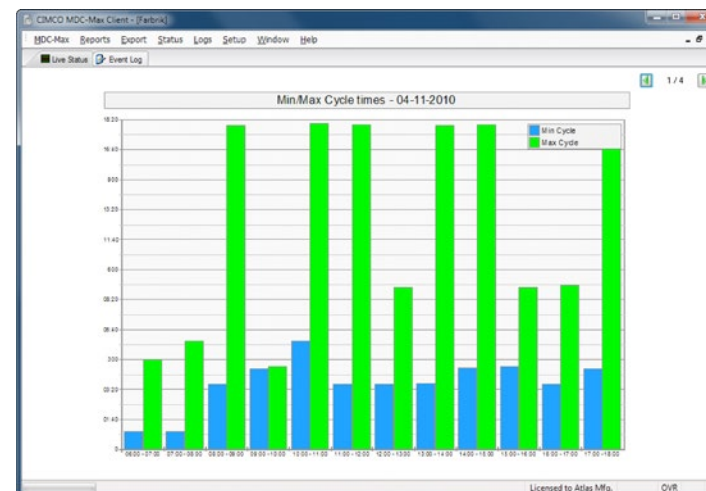
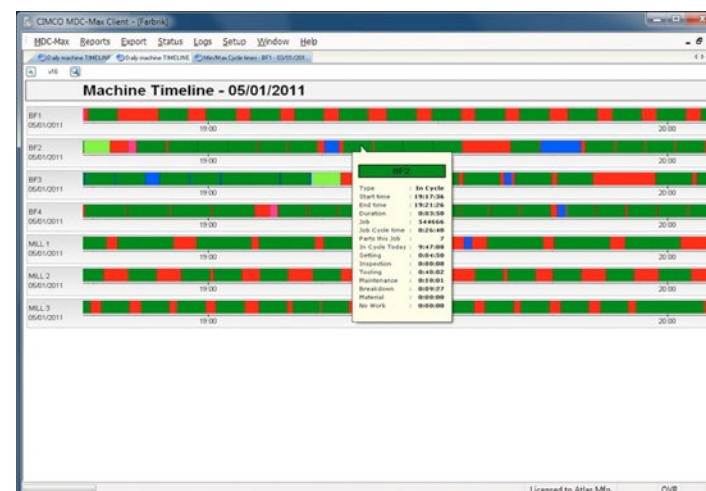
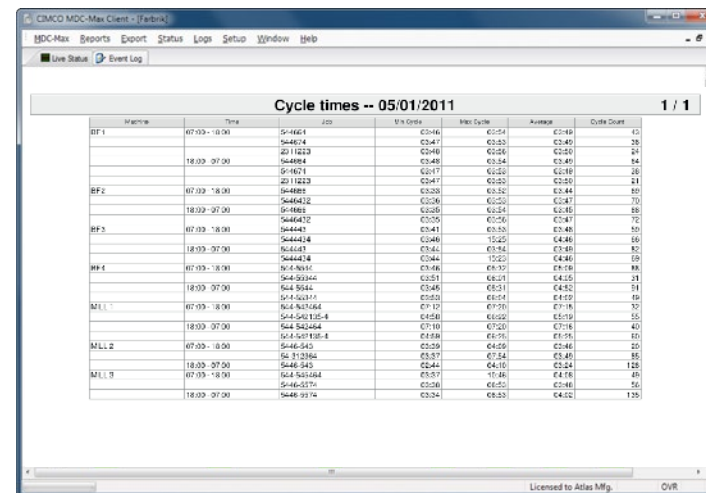
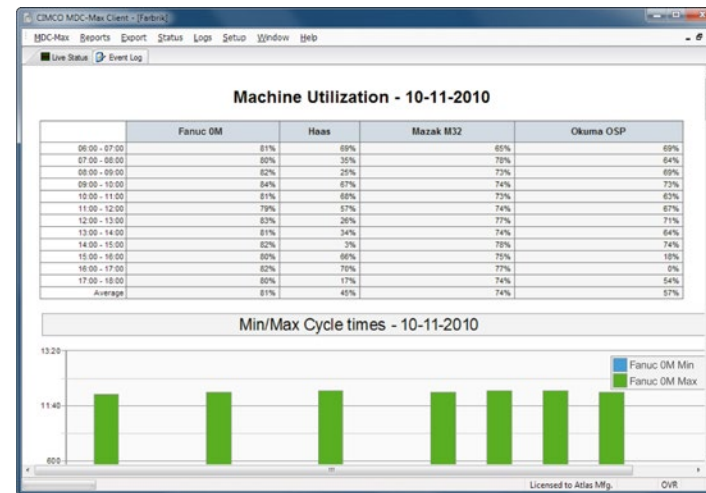
As MDC-Max records all this information you can then produce reports to see how much production time has been lost due to waiting for tooling, etc.



Realtime Machine Display

## Overall Equipment Effectiveness

MDC-Max provides powerful machine data collection to automatically provide the information from your CNC machine tools to produce Overall Equipment Effectiveness (OEE) reports. World-wide studies indicate that the average OEE rate in manufacturing plants is 60%. A World Class OEE is considered to be 85% or better, so clearly there is room for improvement in most manufacturing plants!



## Reports and Graphs

With the built-in report functions you can easily display and visualise your data in order to enable you to explore your productivity information to the degree you require. That way you can see exactly what is happening with your production schedules.

- 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)
- Realtime Machine Display (see which machines are running at a glance)

## A truly integrated solution

CIMCO MDC-Max is fully integrated with CIMCO DNC-Max and CIMCO NC-Base giving you a complete DNC, document gathering and Machine Data Collection system from one supplier.

*DNC-Max* is responsible for collecting all the machine tool data for in-cycle and number of parts produced. The data is stored in the NC-Base database. DNC-Max also controls the sending and receiving of CNC programs to your range of machine tools. Programs can be requested from the machine control, thus avoiding the operator having to leave his machine. Any program changed by the operator and sent back to DNC-Max can be automatically raised in version or stored in a quarantine area. This gives you the ability to track changes and revert back to any previous version if necessary.

MDC-Max immediately analyses the data stored in NC-Base to produce graphs and charts showing you exactly what is happening with your production schedules.

*NC-Base* allows you to store any documents related to a particular job. These can be drawings, photographs of machine setups, tool lists, operation sheets, CNC programs, etc. This makes finding any information about a particular job extremely easy.

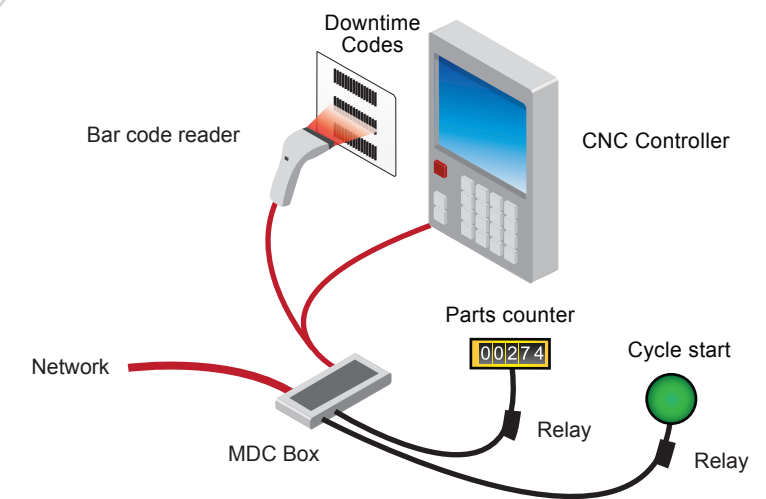
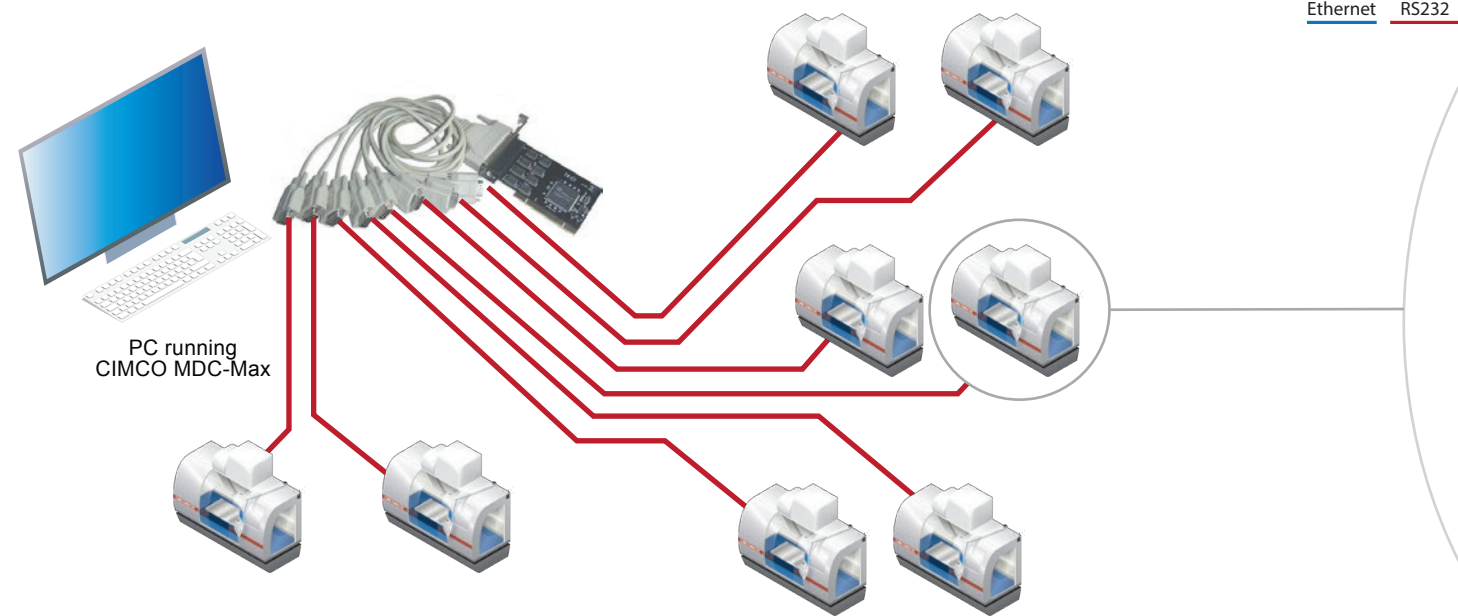
## MDC Network

MDC can be added to your existing DNC network infrastructure. Traditional serial cabling, Ethernet and Wireless infrastructure can all be accommodated without having to replace any existing network infrastructure. MDC I/O modules are installed to the machine to collect the machine status signals. Bar code readers or PC's running the operator screen can be added to set the downtime codes and also request programs to be sent to the CNC.



## Traditional / cabled network

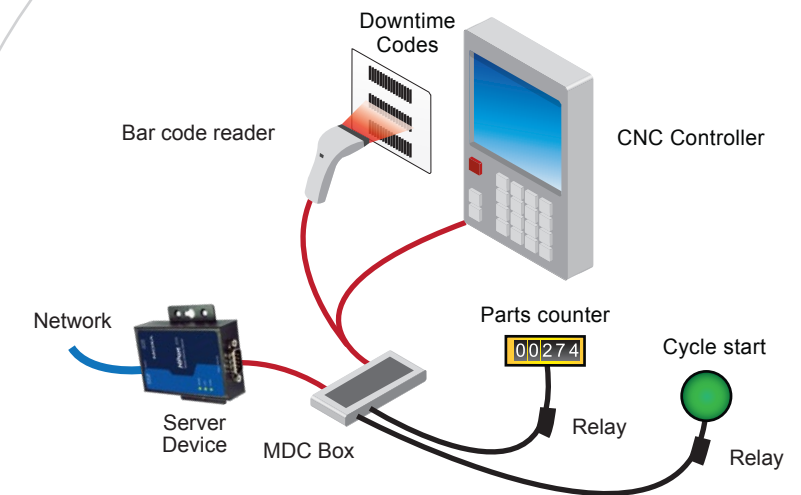
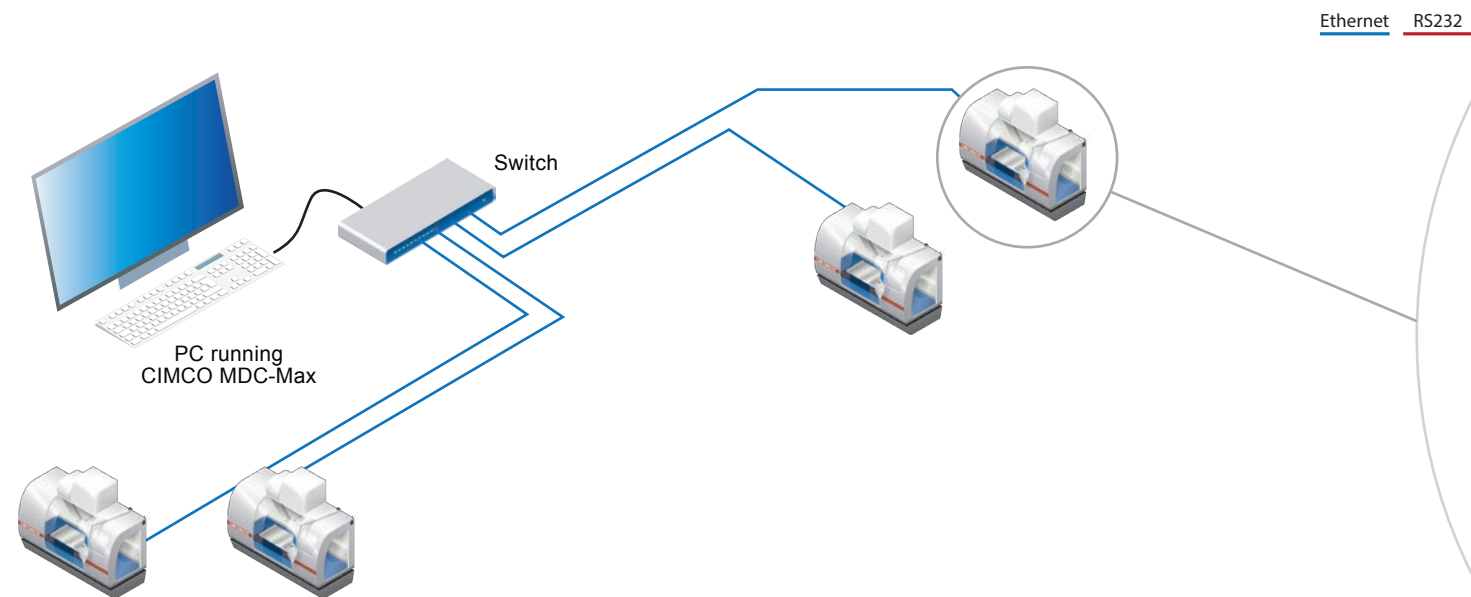
In a traditional cabled network a serial cable is run from a PC to each machine on the shop floor. At the PC the serial RS-232 cables are connected to a Multiport Communications Card installed in the PC. Unused wires in the serial cable are used to monitor the status of the machines. A maximum of 3 CNC status signals can be monitored by DNC-Max Server running on the PC. The status signals are converted to messages by DNC-Max and are stored in the NC-Base Server. MDC-Max client has a number of tools to analyse the data in real time or over a period of time. MDC-Max clients can be run on any networked PC to give you flexibility on what data is shown in different parts of the shop floor.



MDC box connecting CNC machine to network using serial RS-232 cables. MDC box transmits machine status signals (parts counter, cycle start) and optionally downtime codes back to PC running DNC-Max.

## Ethernet network

Many companies have an Ethernet Network on the shop floor and this can be used for the DNC-Max/MDC-Max network. Ethernet cable is run to each machine and standard Ethernet hardware (switches, routers, bridges, etc.) is used to connect the CNC Machines to the PC network. Ethernet cabling is easier to install than using traditional RS232 cable and gives you more flexibility for extending the network.

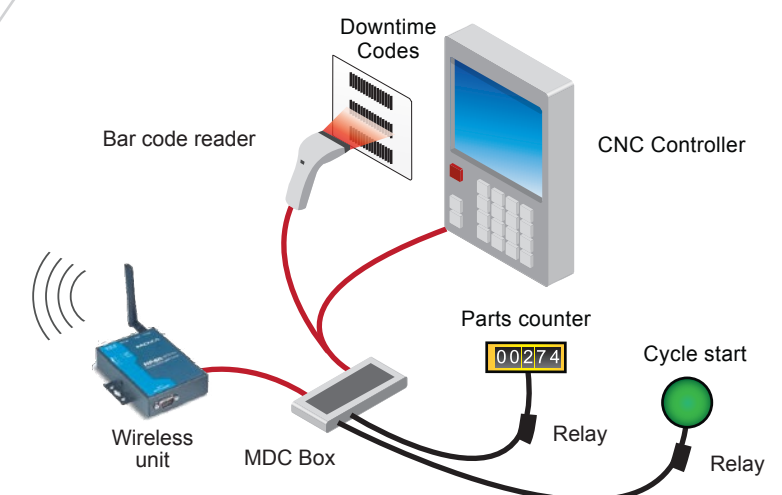
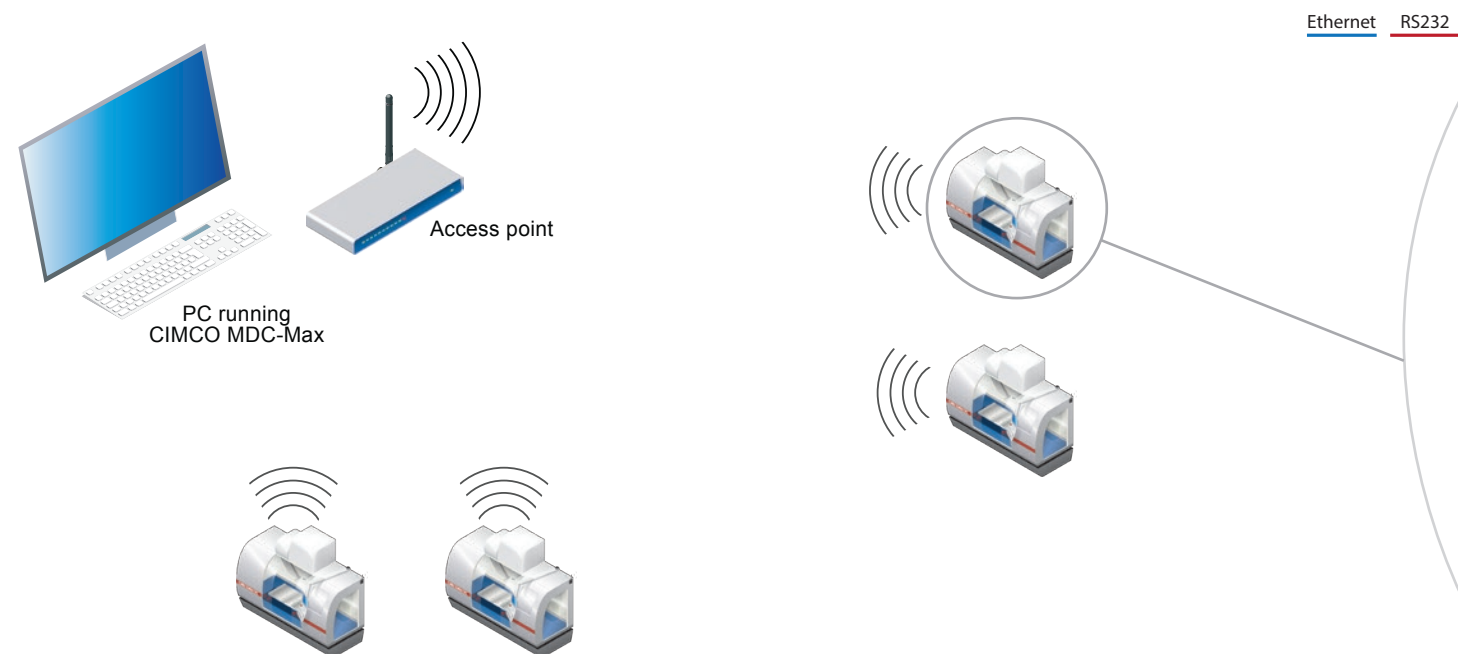


Ethernet to RS-232 Device Server connecting MDC box with Ethernet network. MDC box transmits machine status signals (parts counter, cycle start) and optionally downtime codes back to PC running DNC-Max.

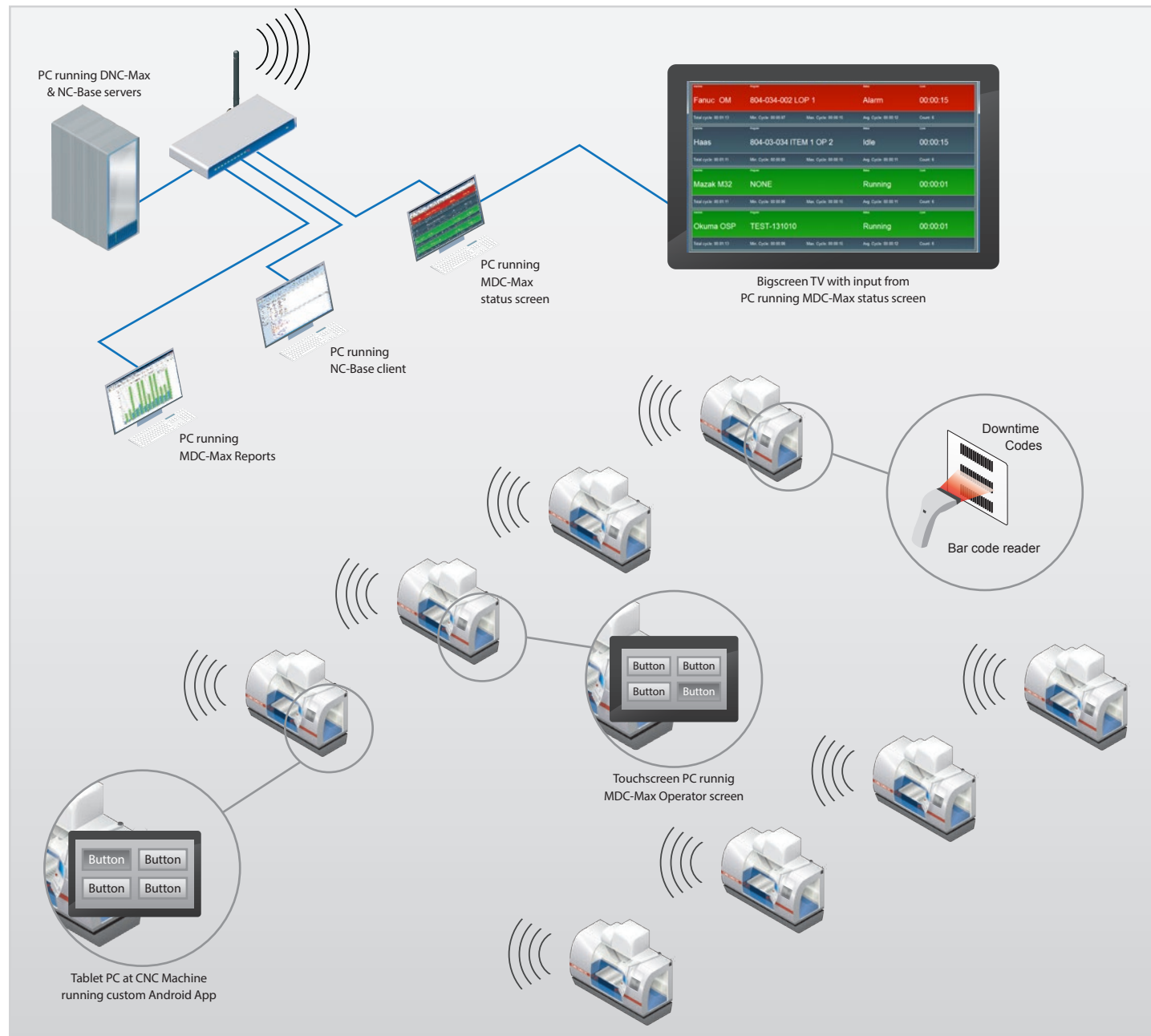
## Wireless network

Wireless networks on the shop floor are becoming more and more popular and eliminate the need to provide cabling to each machine.

If you are moving machines around on the shop floor or expect to add new machines a wireless network can be the best solution. A wireless access point is connected to the existing cabled Ethernet network. Additional access points can be added to extend the coverage of the wireless network. Various network security and encryption methods can be used to provide a secure network.

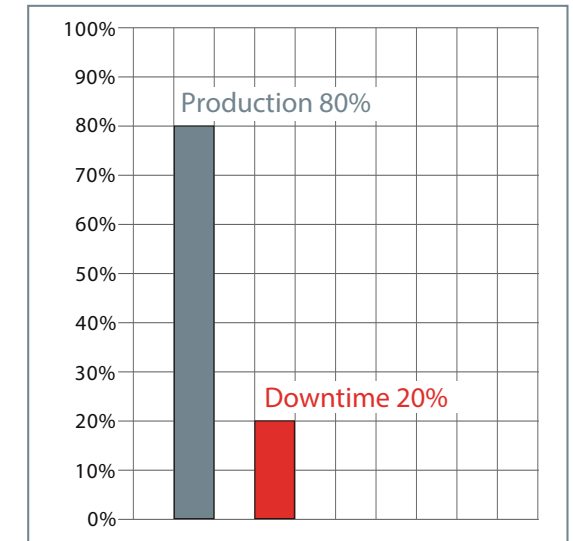
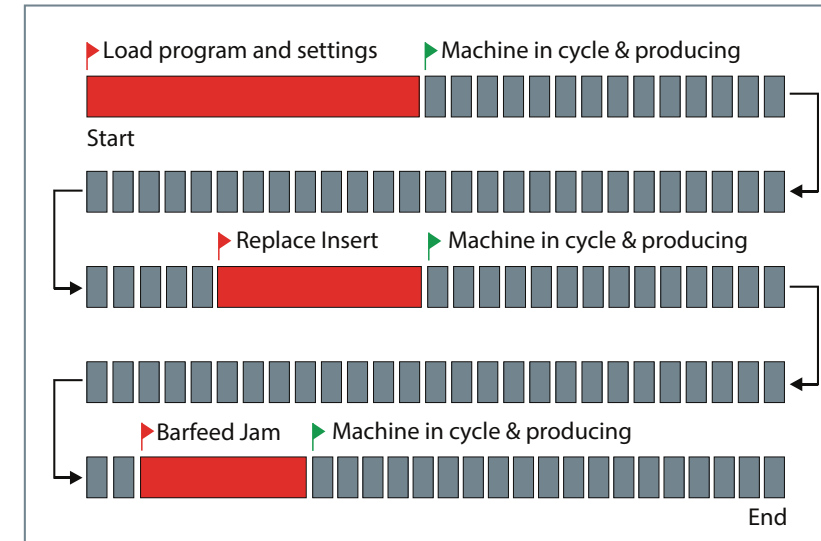


Wireless Ethernet to RS-232 unit connecting MDC box with Ethernet network. MDC box transmits machine status signals (parts counter, cycle start) and optionally downtime codes back to PC running DNC-Max.



## Basic Machine Data Collection

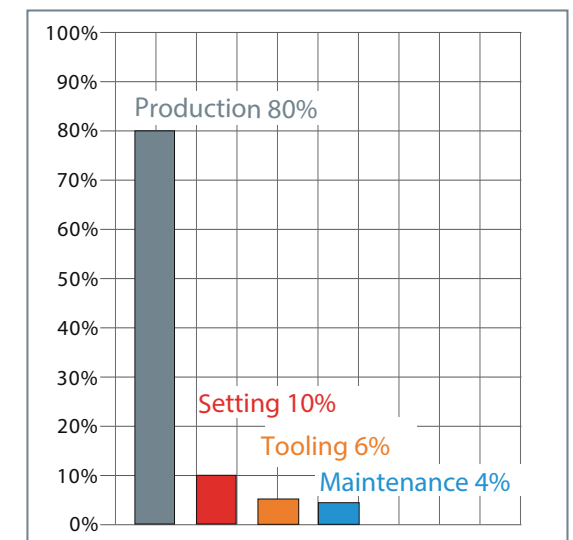
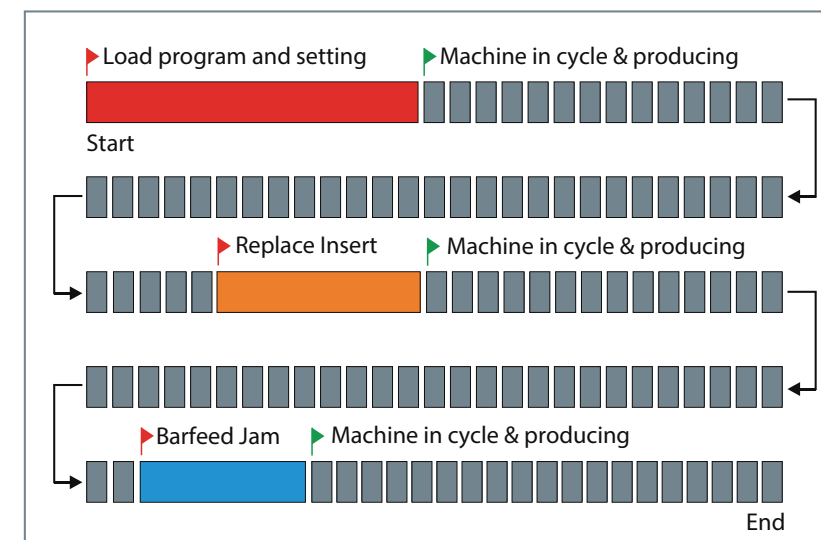
The majority of companies only want to know if a particular machine is running and producing or if it is stopped. The basic data collection will produce charts to show the amount of time the machine has been in production and the amount of time allocated to downtime. It is then up to the supervisor to ask the operator why the machine was not running.



## Advanced Machine Data Collection

With Advanced Machine Data Collection we can provide accurate reporting of the machine tool efficiency on any job. We 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 a bar code reader or a touch screen. The operator simply scans a bar code or uses the touch screen to indicate the reason for the machine downtime. This information can then pinpoint exactly what is causing a loss of production.

**Operator ID login** - know who is logged onto the machine  
**Setter login** - isolate setting time for each job  
**Maintenance ID login** - isolate maintenance from downtime  
**Waiting for material** - operator swipes this to say he is waiting for stores  
**No job** - there are no jobs waiting for the machine  
**Scrap part** - the last part was scrapped  
**Tool broken** - the operator is waiting for a setter



### MDC on a big screen

One of the unique features of MDC-Max is the live screen window that can be run on a large plasma or LCD screen to provide a quick overview of the status of the machines. Big screens are normally installed in a convenient location so that all personnel can quickly see the status of machines. The live screen is part of the MDC client and can be configured to show as much real time data collected from the machines as required.

### Bar code scanner

Bar code scanners are a convenient way to enter downtime codes and other job information. MDC-Max comes with a bar code font that can be used to print a sheet of downtime codes. Each machine can be equipped with a barcode reader or one bar code reader can be used with multiple machines.

### Tablet PC

Instead of installing the bar code system, you can also equip your machines with tablet computers which allow you to easily enter notifications that are directly transferred to the data collection system. The tablet computers are running on an Android operating system and are equipped with a customized app so you can enter all information you need with just a touch of your finger.

### Touch screen PC

Integrated slim PC's with a built in touch screen and wireless or wired Ethernet connection are becoming readily available. These PC's can run the Operator screen of the MDC-Max client for easy data entry. As they are standard PC's they can also run CIMCO NC-Base client for NC program management and editing, or any other Windows programs you may wish to run.

# CIMCO MDC-Max

MDC-Max helps everybody in the Company – not only Management

***“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 2 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 and are now hitting their production targets

## CIMCO MDC-Max highlights manufacturing problem within 24 hours of installation

A CIMCO Machine Data Collection (MDC) system 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 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.

## CIMCO MDC-Max keeps lights-out machining on track

A North West company approached the Advanced Machining Centre in Nelson to find them a solution to their lights-out machining problems. They had 4 automatic bar fed lathes that ran through the night, but occasionally one would stop and no one was there to fix the problem and restart production.

It was decided to install CIMCO MDC-Max which monitored in-cycle from the machines and – if the machines stopped – it would send an email and a text message to a stand-by operator at home. The company has increased production and machine utilization without having to pay increased wage costs.

Reseller

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