



# MPmax

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MPmax provides software functions to visualize the factory and information from the machines. The functions of MPmax will assist in maximizing the utilization of machines, managing tool data, scheduling production and much more.

## The MPmax functions are:

### Core Functionality

<b>Results Viewer</b>	Displays spindle load, axis loads, feed/speed, active program, and other factors related to machine operation
<b>Shop Monitor</b>	Real-time display of the status of the connected machine
<b>Up Time Monitor</b>	Machine utilization display by bar chart and machine operation status display by Gant chart
<b>Alarm Analysis</b>	Displays machine alarms and graphs the high incidence alarms in a Pareto chart

### Options available at no extra charge

<b>e-Monitor</b>	Email notification system
<b>e-SPC</b>	Automatic collection of on-machine measuring data, analyses the data and displays the result by histogram
<b>e-Tool</b>	Manages tooling data for the machines
<b>e-Tool Lite</b>	Displays tool data and has ability to upload and download programs

### Options available requiring additional hardware for an extra charge

<b>Machine Camera</b>	Image display with machine internal camera (requires machine camera option)
<b>Power Monitor</b>	Displays instantaneous power draw and maximum power draw (requires machine power monitor option)

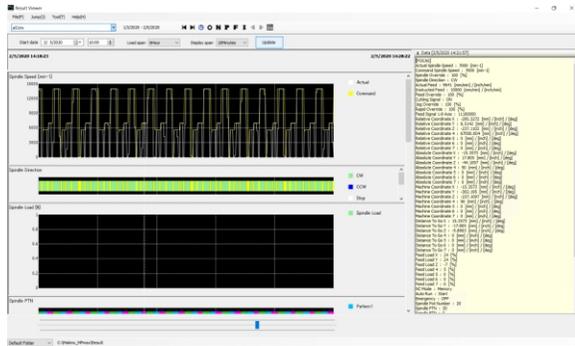
### Only available on MAG and T-series machines for an extra charge

<b>AST Monitor</b>	Monitoring, display and analysis of the spindle and the machine axes
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You can use as many of the MPmax functions as you wish to improve the productivity of your machining operation. MPmax is configurable and distributable to fit your needs. Up to 5 MPmax clients can be connected allowing machine monitoring and data analysis to be performed at any location on the network.

## Result Viewer

Tracks spindle load, axis loads, feed/speed, active program, spindle tool, alarms and other factors related to machine operation. The data is recorded and archived, and users can sort by spindle tool number, alarm number and active program. That way, if there's a performance problem or alarm, the data can lead to accurate resolutions. Additionally, if there is a spindle incident, personnel can see exactly where it happened in the program. Some types of software record the incident to the exact line number in the NC program where it happened, helping the operator easily adjust the cutting parameters.



## Shop Monitor

MPmax shop monitor shows the status at a glance of all the connected machines. The display is configurable so that unneeded fields can be hidden. Shown below is Shop Monitors list view. Shop Monitor also offers a layout view where status icons can be placed on the layout of your facility. Clicking on these icons brings up the detailed status of the machine selected.

MPmax Shop Monitor monitors and displays the status of many states of the machines. The items displayed include CNC Mode, Main Program, Program Comment, Active NC Program, Pallet Number, Alarms, Executing NC Program block, Feed Rate Override Setting and many more.

	AN201 #144	AN202 #77	AN203	AN204 #247	AN205 #88	AN206 #99	AN207 #118	
CNC Mode	Standby	Stand	Manual	Manual	Stand	Stand	Stand	
Main Program	O 0000	O 2007	O 0016	O 0027	O 0034	O 0041	O 0048	
Program Comment	40M00A2001-1	Z7MAH00A2007	ATC MAIN FSK E	SP04A2002-0	SP00B2001-0	Z	40M0A2001-2	
Sequence No.	N 00000							
Spindle Load (%)	400 (50)	200 (25)	3750 (50)	1000 (50)	0 (00)	1000 (51)	0 (0)	
Leveling	E 0100 OFF							
Alarm No.	00000	00000	0	0	0	0	0	
Spindle Rotation	ON	Continuation	Continuation	ON	Continuation	ON	ON	
Spindle Load	410 [%]	0.00 [%]	0.20 [%]	0.21 [%]	0.00 [%]	0.00 [%]	0.00 [%]	
Operative Time	000:27:30h	00:00:11s	00:02:25s	00:10:59s	00:00:00s	00:00:11s	00:00:00h	
Feed Override	100 [%]	0 [%]	0 [%]	100 [%]	0 [%]	100 [%]	100 [%]	
Height Block	OFF	OFF	ON	OFF	OFF	OFF	OFF	
Object	OFF							
Main Mode	OFF							
ATC Interlock	OFF							
ATC Interlock	OFF							
Absolute Coord.	X 50.1800 X 0.0118 X 300.0411 X 0.0000 Y 0.0000 Z 0.0000 C 0.0000	X 50.1800 X 0.0118 X 300.0411 X 0.0000 Y 0.0000 Z 0.0000 C 0.0000	X 50.1800 X 0.0118 X 300.0411 X 0.0000 Y 0.0000 Z 0.0000 C 0.0000	X 50.1800 X 0.0118 X 300.0411 X 0.0000 Y 0.0000 Z 0.0000 C 0.0000	X 50.1800 X 0.0118 X 300.0411 X 0.0000 Y 0.0000 Z 0.0000 C 0.0000	X 50.1800 X 0.0118 X 300.0411 X 0.0000 Y 0.0000 Z 0.0000 C 0.0000	X 50.1800 X 0.0118 X 300.0411 X 0.0000 Y 0.0000 Z 0.0000 C 0.0000	X 50.1800 X 0.0118 X 300.0411 X 0.0000 Y 0.0000 Z 0.0000 C 0.0000
Machine Coord.	X 202.9184 X 0.0000 X 300.4000 X 79.5127 X 0.0000 Y 150.0000 Y 0.0000 Z 0.0000 C 0.0000	X 202.9184 X 0.0000 X 300.4000 X 79.5127 X 0.0000 Y 150.0000 Y 0.0000 Z 0.0000 C 0.0000	X 202.9184 X 0.0000 X 300.4000 X 79.5127 X 0.0000 Y 150.0000 Y 0.0000 Z 0.0000 C 0.0000	X 202.9184 X 0.0000 X 300.4000 X 79.5127 X 0.0000 Y 150.0000 Y 0.0000 Z 0.0000 C 0.0000	X 202.9184 X 0.0000 X 300.4000 X 79.5127 X 0.0000 Y 150.0000 Y 0.0000 Z 0.0000 C 0.0000	X 202.9184 X 0.0000 X 300.4000 X 79.5127 X 0.0000 Y 150.0000 Y 0.0000 Z 0.0000 C 0.0000	X 202.9184 X 0.0000 X 300.4000 X 79.5127 X 0.0000 Y 150.0000 Y 0.0000 Z 0.0000 C 0.0000	X 202.9184 X 0.0000 X 300.4000 X 79.5127 X 0.0000 Y 150.0000 Y 0.0000 Z 0.0000 C 0.0000
Exec. Program	000 G00 Z 115.0000 F 0.0000	G00 G00 Z 115.0000 F 0.0000						



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## e-Monitor

MPmax e-Monitor can be configured to send an Email for variety machine events. Using this functions allow you be notified no matter where you are. e-Monitor can be configured to send you information as many or a few machine events as you wish or e-Monitor will send a machine status Email periodically simply to keep you informed of the machine status.

Below is a summary of some but not all of the notifications available from e-Monitor:

### Alarm Email

In the event of an alarm the alarm time stamp, alarm number alarm message text, pallet number, main O number and program comment, executing O number, executing block, sequence number and execution time are sent.

### Machining Finish Email

When the NC program finishes a time stamp, pallet number, main O number and execution time are sent.

### Operator Call Email

When the machine is in Operator Call a time stamp, pallet number, main O number, executing block, sequence number and execution time are sent.

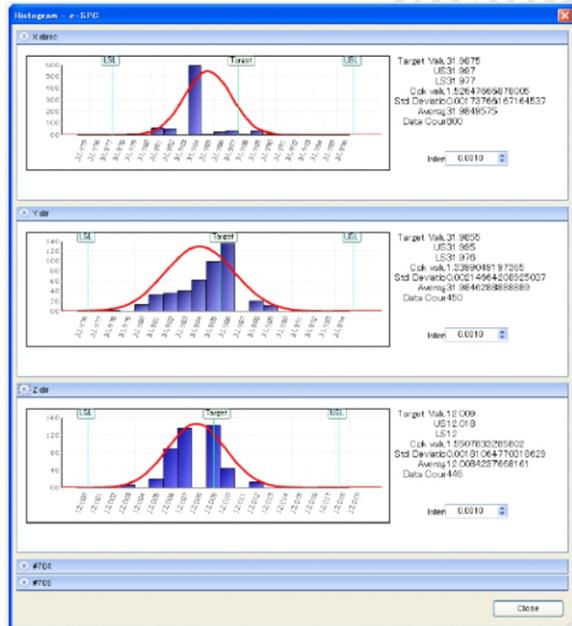
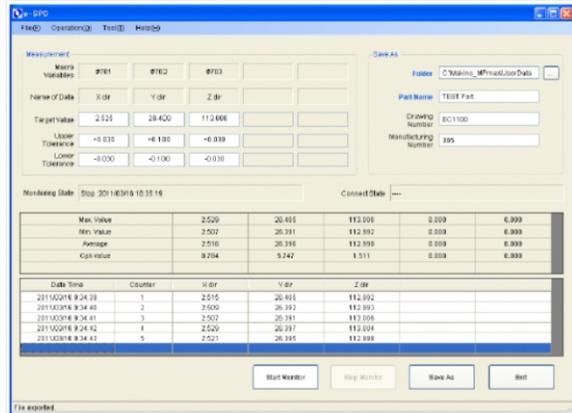
### Macro Change Email

When selected macro variable values change containing a time stamp, pallet number, main O number, executing block, sequence number and execution time are sent.

Machine ID	Server	Service Status	Alarm	Machining Finish	Macro Change	M80, M01	Periodically	Camera Status
A99z #101		Green	Green	Green	Green	Green	Green	Green
A100z #144		Green	Green	Green	Green	Green	Green	Green
MCD016 #138		Green	Green	Green	Green	Green	Green	Green
a81M #547		Green	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow
A99z #100		Green	Green	Green	Green	Green	Green	Green
a61 #209		Green	Red	Green	Green	Green	Green	Green

## e-SPC

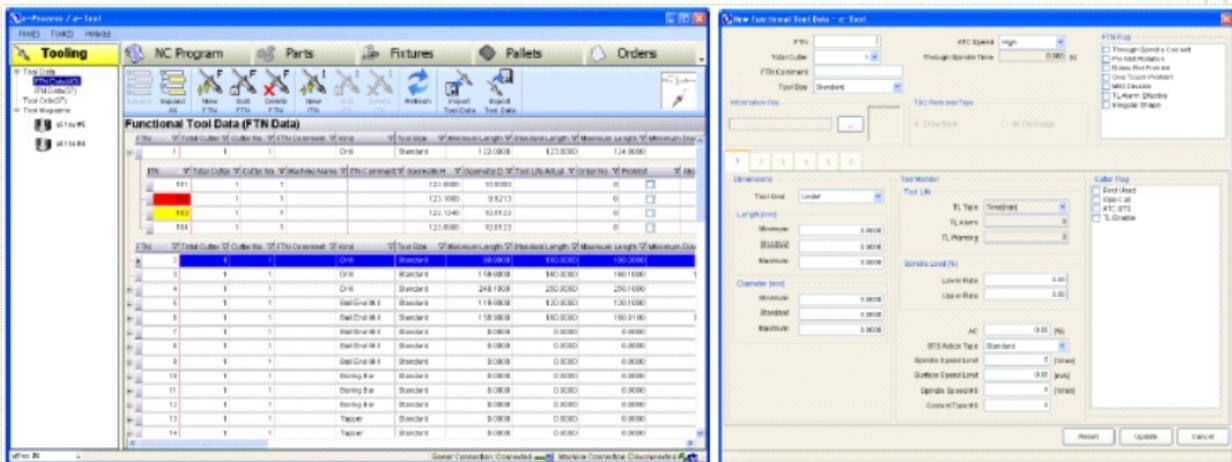
To use MPmax e-SPC the machine must be equipped with the Automatic Work Piece Measuring option. Up to 5 measured values can be transferred from the machine to e-SPC. The user sets the minimum, maximum and target values for the measured feature. e-SPC then uses this data to calculate process capability index (CPK). A histogram of a single or multiple measurement can be displayed.



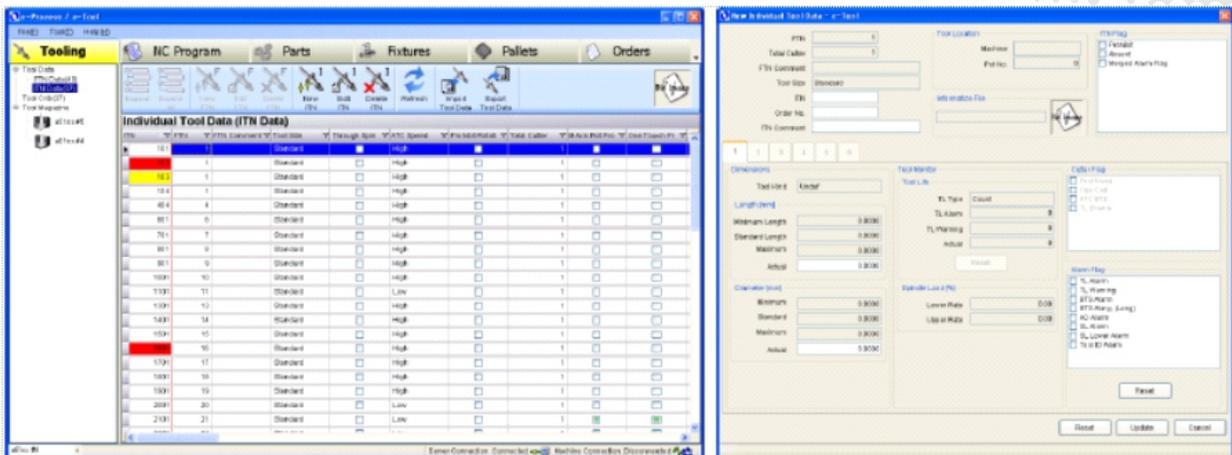
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## e-Tool

MPmax e-Tool can manage the data for all tool required for machining by the machines. This function can manage both functional tool numbers (FTN) for types of tools and the individual tool number (ITN) for specific tool dimensional data. This data can be downloaded to the machine as needed. Tool data such as offset values and tool life values can be managed. The tool information is can be downloaded to the machine when needed. Tool data at the machine can also be uploaded to MPmax to back up this data to be restored later.



Tool FTN Screen



Tool ITN Screen

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## e-Tool Lite

MPmax e-Tool Lite provides a view of tool data status for all machines. This utility makes it possible to upload and download programs between machines and APC.

The screenshot shows the 'e-TOOL Lite' application window. The title bar reads 'e-TOOL Lite'. The menu bar includes 'ファイル(F)', '表示(V)', 'ツール(T)', and 'ヘルプ(H)'. The toolbar has icons for '工場データ' and 'NCプログラム'. The main window title is 'ATCマガパン工具-A99 #3'. On the left, there is a tree view showing machine connections: A100 #5, A100 #3, A100 #2, A100 #1, A99 #3, A99 #2, A99 #1, A99 #0, and NC0018 #2. The main area displays a table of tool data.

番号	FTN	FTN	FTN	スルースピンドル	スルースピンドル特	ATC速度
主軸工具(102)	0	0	0	<input type="checkbox"/>	0.000	高速
小工具(0)	0	0	0	<input type="checkbox"/>	0.000	高速
1	16980	16980	430	<input checked="" type="checkbox"/>	0.000	高速
2	0	12950	282	<input checked="" type="checkbox"/>	0.000	高速
3	10847	10847	481	<input checked="" type="checkbox"/>	0.000	高速
4	0	17506	782	<input checked="" type="checkbox"/>	0.000	高速
5	0	18470	201	<input type="checkbox"/>	0.000	高速
6	0	17564	1891	<input checked="" type="checkbox"/>	0.000	高速
7	16980	16980	372	<input checked="" type="checkbox"/>	0.000	高速
8	0	15110	581	<input checked="" type="checkbox"/>	5.000	低速
9	11902	11902	182	<input checked="" type="checkbox"/>	0.000	高速
10	0	16900	1287	<input checked="" type="checkbox"/>	0.000	高速
11	0	12740	247	<input checked="" type="checkbox"/>	0.000	高速
12	16925	16925	373	<input type="checkbox"/>	0.000	高速
13	0	12925	1088	<input checked="" type="checkbox"/>	0.000	高速
14	16922	16922	380	<input type="checkbox"/>	0.000	高速

The screenshot shows the 'e-TOOL Lite' application window. The title bar reads 'e-TOOL Lite'. The menu bar includes 'ファイル(F)', '表示(V)', 'ツール(T)', and 'ヘルプ(H)'. The toolbar has icons for '工場データ' and 'NCプログラム'. The main window title is 'ab#1 #347'. On the left, there is a tree view showing file locations: My Computer, C:\, and C:\CNC\_MEN. The main area displays a file list.

Name	Size	Type	Date modified
FTP		File folder	2/27/2013 7:01:08 PM
inetpub		File folder	1/28/2013 12:20:01 PM
inetlib		File folder	12/19/2012 10:04:10 ...
Makino		File folder	1/9/2013 9:03:52 PM
Makino_3dmax		File folder	4/2/2013 12:47:22 PM
MemCardBackup		File folder	1/7/2013 5:53:24 PM
MSOCache		File folder	12/25/2012 5:18:51 PM
NCP		File folder	3/26/2013 3:59:52 PM

Name	Size	Comment	Date modified
00075	8 KB	14MS0A101-0-2-3-MC	4/2/2013 21:42:16 PM
00333	27 KB	38M030K1-001-0-2-0-M...	9/8/2012 9:22:10 PM
04001	1 KB	25M06A2003L2004 T...	5/13/2012 2:08:52 PM
04002	1 KB		4/30/2012 1:50:24 PM
04313	27 KB	23F01A22004-0-2-0-MCP	6/6/2011 6:03:42 PM
04330	10 KB	38M030K1-00102-0-3...	8/8/2012 12:53:22 AM
05000	7 KB	IN/OUT CCW	4/3/2009 1:44:40 PM
05001	7 KB	IN/OUT CV	3/23/2009 10:03:40 AM
05002	7 KB	IN/OUT CCW Z	3/23/2009 10:03:42 AM
05003	9 KB	OPEN_CLOSE CCW	4/3/2009 1:44:42 PM
05004	9 KB	OPEN_CLOSE CV	3/23/2009 10:03:44 AM
05005	9 KB	OPEN_CLOSE CCW Z	3/23/2009 10:03:44 AM

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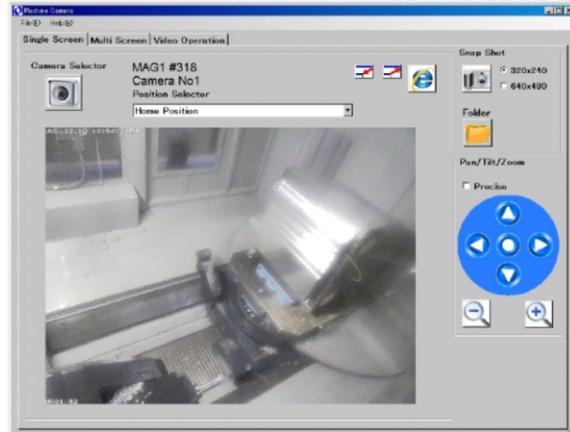
## Machine Camera

The Machine Camera function of MPmax requires the Machine Camera option on the machine. MPmax Machine Camera displays selectable pre-defined view such as for the part or the tool and also allows the camera to be positioned and zoomed to the view of your choice. Images can be recorded and stored locally, viewed on the MPmax Server computer or MPmax Client Computer, transferred to storage media or saved on another PC on the network.

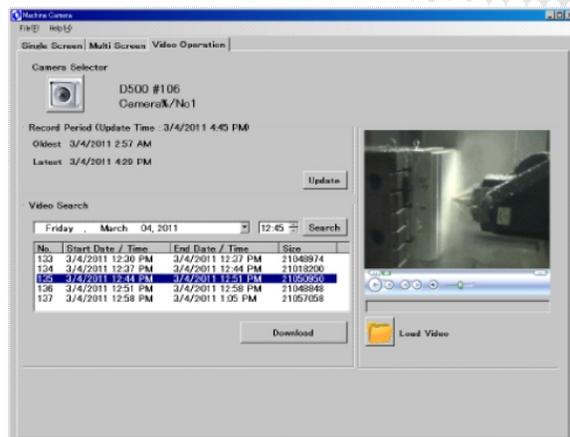
MPmax Machine Camera can be used to capture video of the activity inside the machine. The video files are saved locally and can be played back on the MPmax Server computer or MPmax Client, transferred to storage media or save to another computer on the network.

The MPmax Machine Camera feature can also be set up to capture and image of the part or the tool to be sent in the event of an alarm or when the part finishes from the MPmax e-Monitor function.

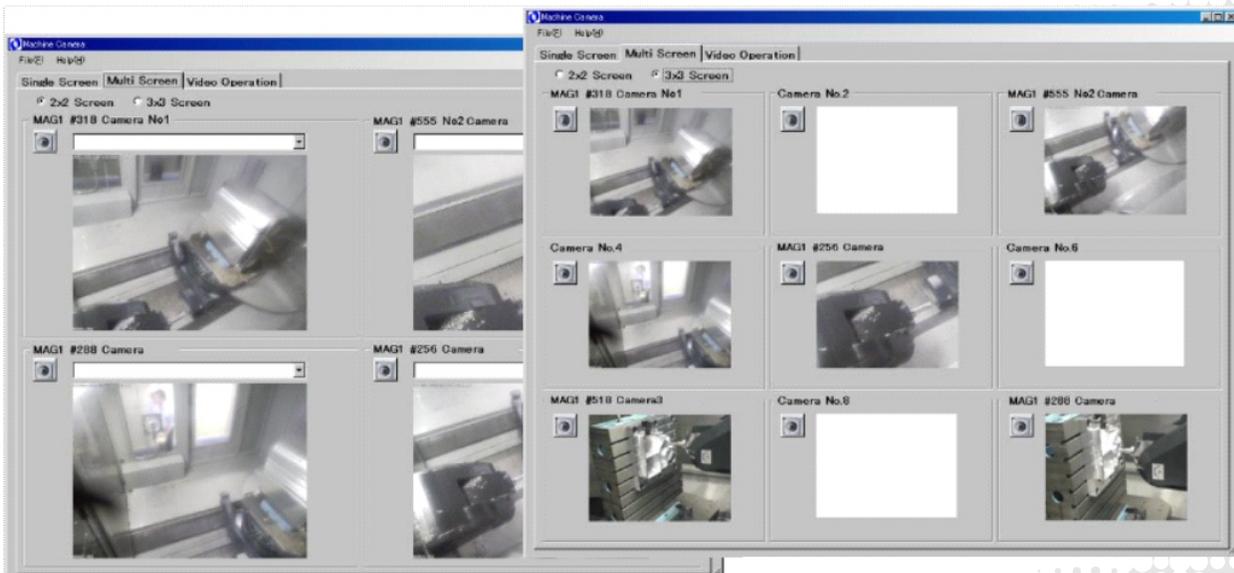
MPmax Machine Camera has the capability to display the images from up nine machines on a single display.



MPmax Camera Viewer



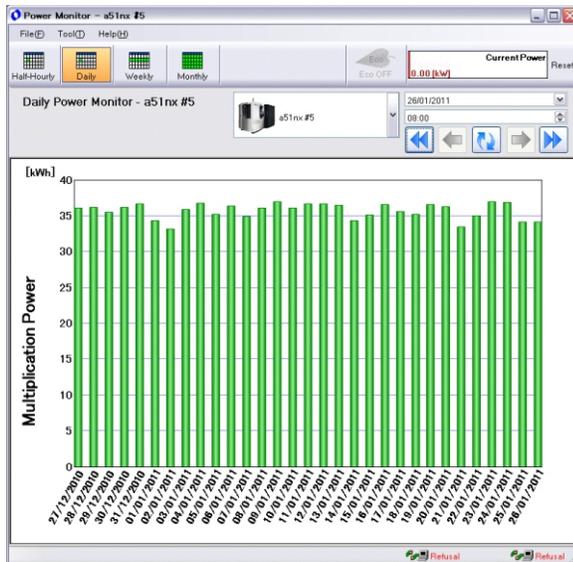
MPmax Video Capture



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## Power Monitor

MPmax Power Monitor can be used if the machine is equipped with the power monitor option. Power Monitor records and displays machine power consumption in real time. In analysis mode the power consumption can be displayed in selectable increments of half hour, day, week or month.



Daily Power Consumption Display

## AST Monitor

MPmax AST Monitor monitors and stores the spindle feed speed, spindle rotation speed, spindle load as well as the feed axis loads. This data is displayed in real time and is stored for later analysis. If the machine is equipped with the axial and radial load sensors this data is also monitored and stored.



# MPmax

## Available MPmax Configurations

MPmax is available in two configurations, network type and built in type. In the network type configuration up to 20 Makino machines can be connected along with up to 5 MPmax clients.

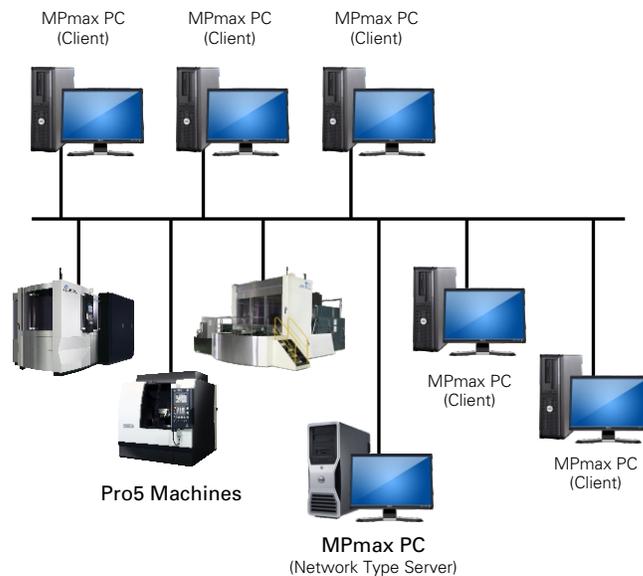
A central server PC is used for data collection and displaying all MPmax functions. The MPmax clients are used to display the MPmax functions. Makino Pro6, Pro5, Pro3, ProP, ProF controlled milling machines, MGH and Hyper-i controlled sinker EDM machines and MGW controlled wire EDM machines can all be connected to MPmax.

The built in MPmax is only available for the MAG, T and D series machines. With the built-in type, all MPmax functions are available and MPmax clients can also be connected. In this case, MPmax is conveniently located for easier use at a single machine.

MTConnect data can be used with Shop Monitor and Uptime Monitor depending on what data is provided by other equipment manufacturers.

Function	Pro6	Pro5 (FS30i/31i)	Pro5 (FS16i/18i)	Pro3, F, L, P
Shop Monitor	●	●	●*	●*
Machine Camera	●	●		
AST Monitor	●	●		
Professional 5 Viewer	●	●		
e-Monitor	●	●		
Uptime Monitor	●	●	●*	●*
Alarm Analysis	●	●		
Power Monitor	●	●		
Result Viewer	●	●		
e-SPC	●	●		
e-Tool Lite	●	●		

\*Some items cannot be displayed



# MPmax

## Built-in MPmax

The built-in MPmax is only available for the MAG, T and D series machines. With the built-in type, all MPmax functions are available and MPmax clients can also be connected. In this case, MPmax is conveniently located for easier use at a single machine.

