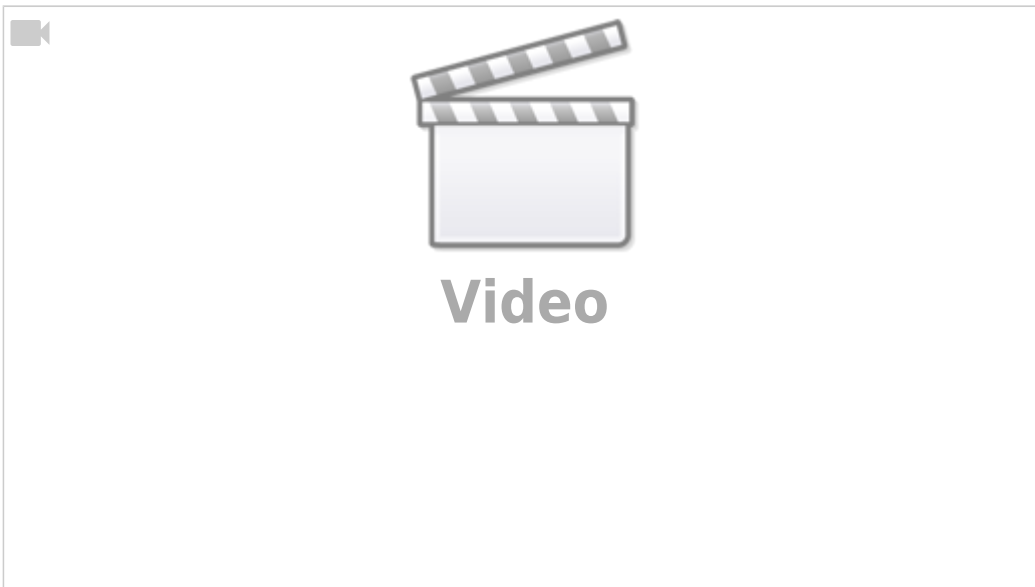


MQL - Minimum Quantity Lubrication



myCNC software allows the user to implement MQL, or Minimum Quantity Lubrication, on their machines.

MQL is a process in which tiny drops of high-quality aerosol lubricant are sprayed over the cutting tool and the material, providing lubrication at extremely low rates of lubricant use. This allows for a greatly reduced fluid usage (with the workpiece being nearly dry throughout the lubrication process) as opposed to typical flood setups, resulting in a greener environmental impact and eliminating the need for fluid disposal.

MQL is available in myCNC software by going into the Step/Dir Coolant control tab within User Settings, where you can set the coolant rate.



Speed		
	XY, mm/min	Z, mm/min
Cutting Speed	500	500
Rapid Speed	500	500
Jog Speed	1500	1000
Probe Speed		-1
Acceleration	1000	1000

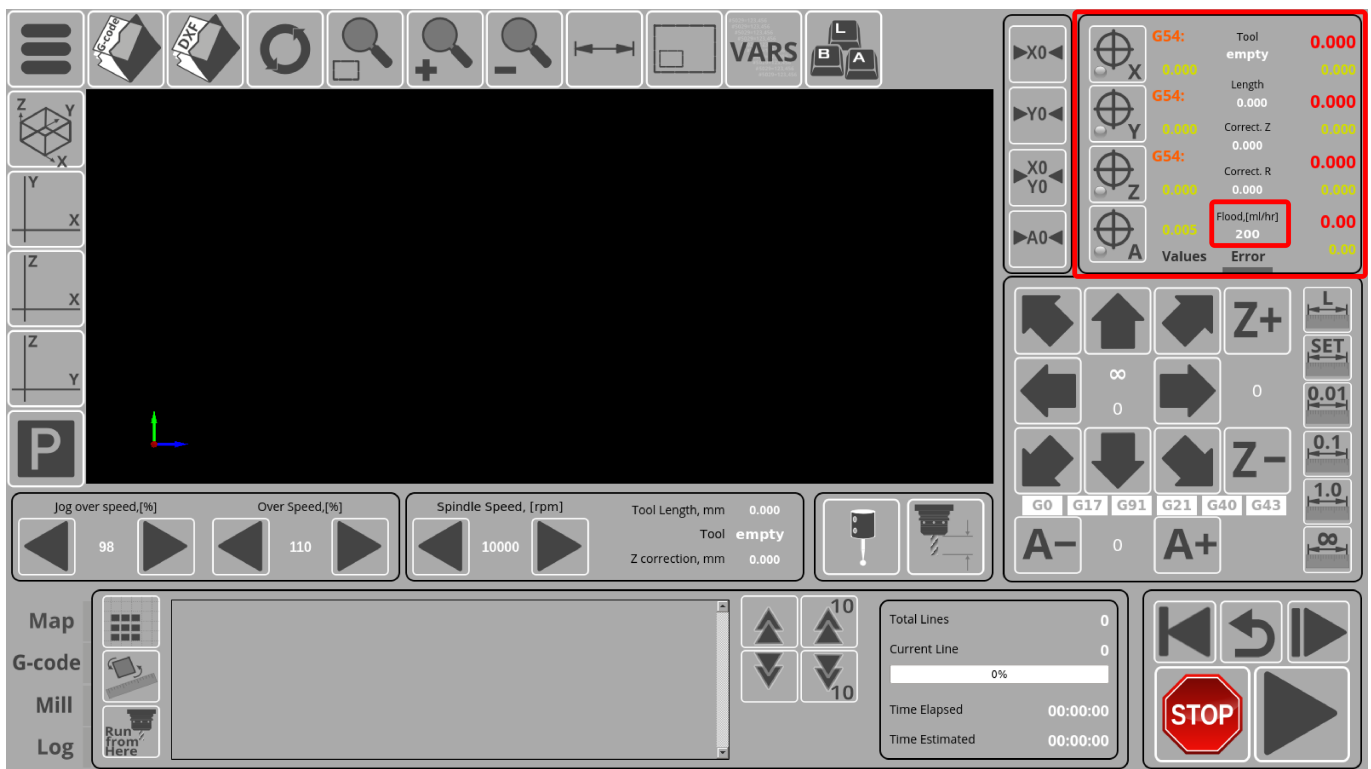
Spindle			
On Delay, sec	0.5	Spindle Off Delay, sec	0.5
Lift Programming	ABS	Lift Height, mm	10.0
Lift Speed, mm/min	1000		

Step-Dir Coolant control			
Rate, ml/hour	6.5	Ratio	1359

Mileage/Oil Change			
X Trip counter	0.031	of	3
Y Trip counter	0.028	of	3
Z Trip counter	0.000	of	3

The fine-tuning is done through the built-in PLC procedures, with the setup described in detail in the [Independent Pulse Generator](#) manual.

In certain profiles (such as the X1366M4E), the MQL functionality is accessible via the main myCNC screen (in the Coordinates section):



This on-screen element displays the current Flood Coolant Rate (global variable #8133).

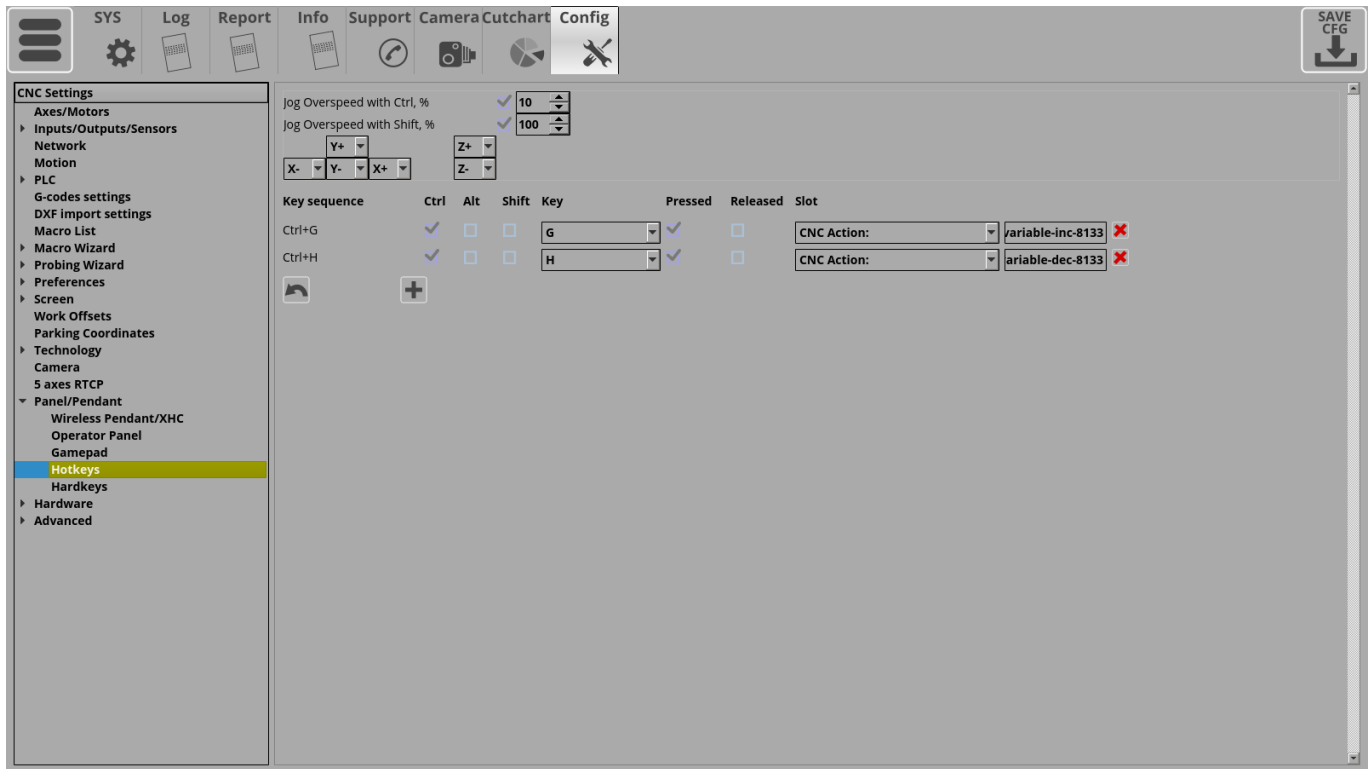
A series of hotkeys can also be assigned within the myCNC software to quickly control the flood rate. This can be done by going into Settings > Config > Panel/Pendant > Hotkeys, and assigning two new keyboard shortcuts with the following actions:

```
cnc-gvariable-inc-8133
```

and

```
cnc-gvariable-dec-8133
```

The following screenshot shows an example configuration of two key bindings to increase and decrease the flood rate:



This will allow the user to quickly change the coolant flood rate from their keyboard.

MQL Setup in myCNC software

This section has been copied from the Independent Pulse Generator manual linked above.

Software PLC for MQL

The rate, ratio and acceleration can be set up in the Software PLC, as well as in the User Settings widget (the Step-Dir Coolant Control section).

“HANDLER_INIT.plc” procedure is started just after the configuration is sent to the myCNC controller. A few lines to set up the Frequency generator can be added there.

[Show HANDLER_INIT code](#)

HANDLER_INIT.plc

```
main()
{
  gvarset(60000,1); //run Servo ON procedure

  gvarset(8131, 8000); //set Frequency acceleration
  gvarset(8132, 1359); //set Ratio
  gvarset(8133, 0);    //Off the Generator.
```

```
exit(99);  
};
```

Hardware PLC for MQL

In addition to the software HANDLER_INIT PLC, certain hardware PLC procedures must be changed for the Minimum Quantity Lubrication to be set up.

Function coolant_motor_start() is added to the mill-func.h file:

[Show mill-func.h code](#)

[mill-func.h](#)

```
coolant_motor_start()  
{  
    timer=10;do{timer--;}while(timer>0);  
  
    gvarset(8131,1000000); //acceleration  
    timer=10;do{timer--;}while(timer>0);  
  
    x=gvarget(8133); //get the speed (frequency)  
    k=gvarget(8132); //get the ratio  
  
    x=x*k; //calculate the RAW frequency  
    gvarset(8130,x); //send the raw frequency to the register  
    timer=30;do{timer--;}while(timer>0); //wait a time for the frequency  
    value to be delivered  
};
```

M08.plc procedure which starts the coolant motor would be the following (*note the inclusion of mill-func.h at the beginning of the code*):

[Show M08 code](#)

[M08.plc](#)

```
#include pins.h  
#include mill-func.h  
  
main()  
{  
    gvarset(7372,1);  
    portset(OUTPUT_FLOOD); //  
    coolant_motor_start();
```

```
exit(99);    //normal exit  
};
```

A procedure M09.plc to stop a coolant motor is simpler - we simply need to write "0" to the raw frequency register.

[Show M09 code](#)

M09.plc

```
#include pins.h  
main()  
{  
    gvarset(7373,0);  
    gvarset(7372,0);  
  
    portclr(OUTPUT_FLOOD);  
    portclr(OUTPUT_MIST);  
  
    gvarset(8130,0); //stop the pulse generator  
    timer=30;do{timer--;}while(timer>0); //wait a time for the frequency  
value to be delivered  
    exit(99);    //normal exit  
};
```

This concludes the software setup for MQL within the myCNC software.

From:

<http://docs.pv-automation.com/> - **myCNC Online Documentation**

Permanent link:

<http://docs.pv-automation.com/mycnc/mql>

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