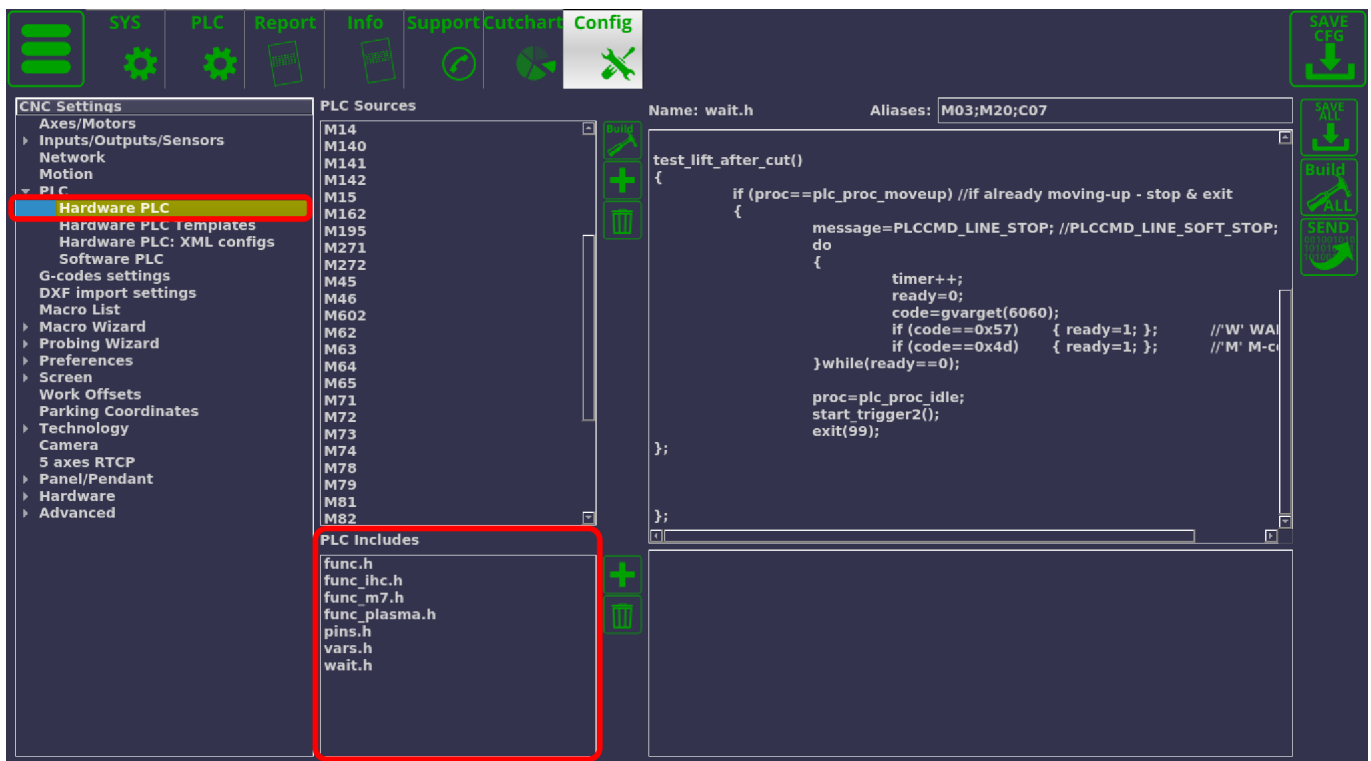


PLC Includes for X1366P

The PLC Includes files allow to systematize and share values and functions among the Hardware and Software PLC procedures within your profile. The below list includes information for the default version of the myCNC X1366P Plasma Cutting profile. The information may differ between profiles, as well as different versions of profiles, and should be used as a general reference only.

A list of G-codes within myCNC software is provided here for reference: [G-Codes list](#)



File - pins.h

Defines hardware inputs and outputs (referred to via names, such as OUTPUT_MARKER, INPUT_ARC, etc).

NOTE: The `pins.h` file is present both in the Hardware and Software PLC tabs within your Settings. On Linux systems, the `pins.h` labels create a link to a single file - when the values are changed in either the Software or the Hardware tab, they also automatically change in the other upon program reload. This implementation does not work under Windows, therefore the programmer must monitor the synchronization on their own and update the values in both files in order for the changes to take effect correctly.

File - func_plasma.h

Contains plasma cuttings functions (typically related to THC, THC triggers, etc)

Included in: M02 End Program, M45 Start Plasma Marking, M71 Start Cutting, M74 Stop Cutting, M271,

M272, OFF

start_thc()

[Show code](#)

```
start_thc()
{
    if (thc_enabled!=0) //start THC control
    {
        gvarset(7570,thc_avc_start); //THC #0 ON
        timer=3;do{timer--;}while(timer>0);
    };
};
```

Included in: M45, M71, M271

stop_thc()

[Show code](#)

```
stop_thc()
{
    gvarset(7570,0); //THC #0 ON
    timer=3;do{timer--;}while(timer>0);
};
```

Included in: M02, M74, M271, OFF (inactive),

stop_trigger1()

[Show code](#)

```
stop_trigger1()
{
    //stop watching for plasma sensor
    message=PLCCMD_TRIGGER1_OFF;
    timer=3;do{timer--;}while(timer>0);
};
```

Included in: M02, M74, M271, OFF (inactive),

stop_trigger2()

[Show code](#)

```
stop_trigger2()
{
    //stop watching for plasma sensor
    message=PLCCMD_TRIGGER2_OFF;
    timer=3;do{timer--;}while(timer>0);
};
```

Included in: currently not utilized in any hardware PLCs by default

start_trigger1()

[Show code](#)

```
start_trigger1()
{
    //stop watching for plasma sensor
    message=PLCCMD_TRIGGER1_ON;
    timer=3;do{timer--;}while(timer>0);
};
```

Included in: M71, M271

start_trigger2()

[Show code](#)

```
start_trigger2()
{
    //stop watching for plasma sensor
    message=PLCCMD_TRIGGER2_ON;
    timer=3;do{timer--;}while(timer>0);
};
```

Included in: M02, M74 (inactive), M271 (inactive)

do_wait_pierce()

[Show code](#)

```
do_wait_pierce()  
{  
    timer=ihc_pierce_time;do{timer--;}while(timer>0);  
};
```

Included in: M71, M271

do_wait_plasma()

[Show code](#)

```
do_wait_plasma()  
{  
  
    timer=timeout_plasma_ready; //wait till plasma arc ready  
    do  
    {  
        timer--;  
        a=portget(INPUT_ARC);  
        if (a!=0) { timer=0; };  
    }while(timer>0); //pause  
  
    a=portget(INPUT_ARC); //doublecheck arc sensor  
    if (a==0)  
    {  
        message=PLCCMD_TRIGGER2_ON;  
        timer=3;do{timer--;}while(timer>0);  
        portclr(OUTPUT_PLASMA);  
        exit(plc_exit_plasma_fail);  
    };  
};
```

Included in: M45, M71, M271

test_lift_after_cut()

[Show code](#)

```
test_lift_after_cut()  
{  
    if (proc==plc_proc_moveup) //if already moving-up - stop & exit  
    {  
        message=PLCCMD_LINE_STOP; //PLCCMD_LINE_SOFT_STOP;//skip line  
        do  
        {
```

```
    timer++;
    ready=0;
    code=gvarget(6060);
    if (code==0x57) { ready=1; };// 'W' WAIT
    if (code==0x4d) { ready=1; };// 'M' M-code
}while(ready==0);
proc=plc_proc_idle;

//start_trigger2();
exit(99);
};
};
```

Included in: M02, M74

do_lift_after_cut()

[Show code](#)

```
do_lift_after_cut()
{
    need_lift=1;

    if (proc!=plc_proc_plasma) { need_lift=0; };
    if (ihc_lift_after_cut<1) { need_lift=0; };

    code=gvarget(6060);
    if (code!=0x4d) { need_lift=0; };

    if (need_lift!=0)
    {
        proc=plc_proc_moveup;
        speedz=gvarget(7043);//Rapid Speed Z
        gvarset(7080,speedz);

        g0moveA(0x0,0x4,ihc_lift_after_cut); //Z axis
        timer=200;do{timer--;}while(timer>0);

        do
        {
            ready=0;
            code=gvarget(6060);
            if (code==0x57) { ready=1; }; // 'W' WAIT
            if (code==0x4d) { ready=1; }; // 'M' M-code

            //a=portget(INPUT_HOME_Z);
            //if (a==0)
```

```
//{  
//  ready=1;  
//  message=PLCCMD_LINE_STOP; //PLCCMD_LINE_SOFT_STOP;//skip line  
//  timer=10;do{timer--;}while(timer>0);  
//}; //Home Z zensor (top position)  
}while(ready==0);  
};  
};
```

Included in: M02, M74

File - func.h

General functions (currently contains timeout codes).

Included in: M89, M90, M162

timeout_10ms()

[Show code](#)

```
timeout_10ms()  
{  
    timer=10; do { timer--;}while(timer>0);  
};
```

Included in: currently not utilized in any hardware PLCs by default

timeout_2ms()

[Show code](#)

```
#define timeout_2ms();    texit=timer+2;do{timer++;}while(timer<texit);
```

Included in: M90

File - func_m7.h

Included in: M07

Plasma Dot Marking (M07) functions (as described in the [G-codes list manual here](#)).

do_move_marking_height()

[Show code](#)

```
do_move_marking_height()
{
    speedz=gvarget(7043);
    gvarset(7080,speedz); //Set speed;

    if (var_marking_height>5)
    {
        g0moveA(0x0,0x4,var_marking_height);//Z axis, ignition_height
        timer=200;do{timer--;}while(timer>0);//wait till motion started
        do { code=gvarget(6060); }while(code!=0x4d);//wait till motion
finished
        };
    };
};
```

Included in: M07

do_marking_probe()

[Show code](#)

```
do_marking_probe()
{
    gvarset(7080,var_marking_probe_speed);//set speed;
    timer=5;do{timer--;}while(timer>0);

    //message=PLCCMD_TRIGGER2_OFF;
    //timer=5;do{timer--;}while(timer>0);

    //portset(OUTPUT_PROBE);

    sens=portget(INPUT_IHC);
    if (sens==0)
    {
        g0moveA(0x0,0x4,0-30000);//Z axis,
        timer=200; do{timer--;}while(timer>0);//wait till motion started

        do
        {
            code=gvarget(6060);
            sens=portget(INPUT_IHC);
```

```
    if (sens!=0)
    {
        code=1;
        message=PLCCMD_LINE_STOP;//skip line
    };
}while (code==0);
do { code=gvarget(6060); }while(code!=0x4d);//wait till motion
finished
};

//portclr(OUTPUT_PROBE);

};
```

Included in: M07

File - vars.h

Defines variables within the M-codes.

Included in: M02, M07, M08, M45, M46, M71, M72, M73, M74, M78, M195, M271, M272, TRIG01, EST, OFF

File - wait.h

“Waiting” functions - used to wait till motion finished.

Included in: currently not utilized in any hardware PLCs by default

wait4wait()

[Show code](#)

```
wait4wait()
{
    do
    {
        timer++;code=gvarget(6060);
        loop=1;
        if (code==0x4d){loop=0;};
        if (code==0x57){loop=0;};
        a=portget(4);
        if (a==0)      { loop=0; };
    }
```



```
    }while(loop==1);    //wait till motion finished  
  
};
```

Included in: currently not utilized in any hardware PLCs by default

test_lift_after_cut()

[Show code](#)

```
test_lift_after_cut()  
{  
    if (proc==plc_proc_moveup) //if already moving-up - stop & exit  
    {  
        message=PLCCMD_LINE_STOP; //PLCCMD_LINE_SOFT_STOP;//skip line  
        do  
        {  
            timer++;  
            ready=0;  
            code=gvarget(6060);  
            if (code==0x57)    { ready=1; };    //'W' WAIT  
            if (code==0x4d)    { ready=1; };    //'M' M-code  
        }while(ready==0);  
  
        proc=plc_proc_idle;  
        start_trigger2();  
        exit(99);  
    };  
  
};
```

Included in: currently not utilized in any hardware PLCs by default (code in func_plasma.h utilized instead, code block planned to be removed in the upcoming updates).

File - func_ihc.h

Initial Height Control functions.

Included in: M45, M71, M271, M272

do_plasma_probe()

[Show code](#)

```
do_plasma_probe()
{
    gvarset(7080,ihc_probing_speed);//set speed;
    timer=5;do{timer--;}while(timer>0);

    if (ihc_enabled!=0)
    {
        message=PLCCMD_TRIGGER2_OFF;
        timer=5;do{timer--;}while(timer>0);

        portset(OUTPUT_PROBE);
        timer=200; do{ timer--; }while (timer>0);
        sens=portget(INPUT_IHC);
        if (sens==0)
        {
            g0moveA(0x0,0x4,0-30000);//Z axis,
            timer=200; do{timer--;}while(timer>0);//wait till motion started

            do
            {
                code=gvarget(6060);
                sens=portget(INPUT_IHC);
                if (sens!=0)
                {
                    code=1;
                    message=PLCCMD_LINE_STOP;//skip line
                };
            }while (code==0);
            do { code=gvarget(6060); }while(code!=0x4d);//wait till motion
finished
        };
    };
    portclr(OUTPUT_PROBE);
};
```

Included in: M45, M71, M271, M272

do_move_ignition_height()

[Show code](#)

```
do_move_ignition_height()
{
```

```
speedz=gvarget(7043);
gvarset(7080,speedz); //Set speed;
if (ihc_enabled!=0)
{
    ihc_current_height=ihc_correction_height+ihc_ignition_height;
    if (ihc_current_height>5)
    {
        g0moveA(0x0,0x4,ihc_current_height);//Z axis, ignition_height
        timer=200;do{timer--;}while(timer>0);//wait till motion started
        do { code=gvarget(6060); }while(code!=0x4d);//wait till motion
finished
    };
};
};
```

Included in: M45, M71, M271, M272

do_move_pierce_height()

[Show code](#)

```
do_move_pierce_height()
{
    ihc_current_height=ihc_pierce_height-ihc_ignition_height;

    if (ihc_current_height>5)
    {
        g0moveA(0x0,0x4,ihc_current_height);//Z axis, pierce_height
        timer=200;do{timer--;}while(timer>0);//wait till motion started
        do { code=gvarget(6060); }while(code!=0x4d);//wait till motion finished
    };
};
```

Included in: M71, M271

do_move_cutting_height()

[Show code](#)

```
do_move_cutting_height()
{
    ihc_current_height=ihc_cutting_height-ihc_pierce_height;

    if (ihc_current_height!=0)
    {
```

```
g0moveA(0x0,0x4,ihc_current_height); //Z axis, cutting_height
timer=200;do{timer--;}while(timer>0); //wait till motion started
do { code=gvarget(6060); }while(code!=0x4d); //wait till motion finished
};
};
```

Included in: M45, M71, M271

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