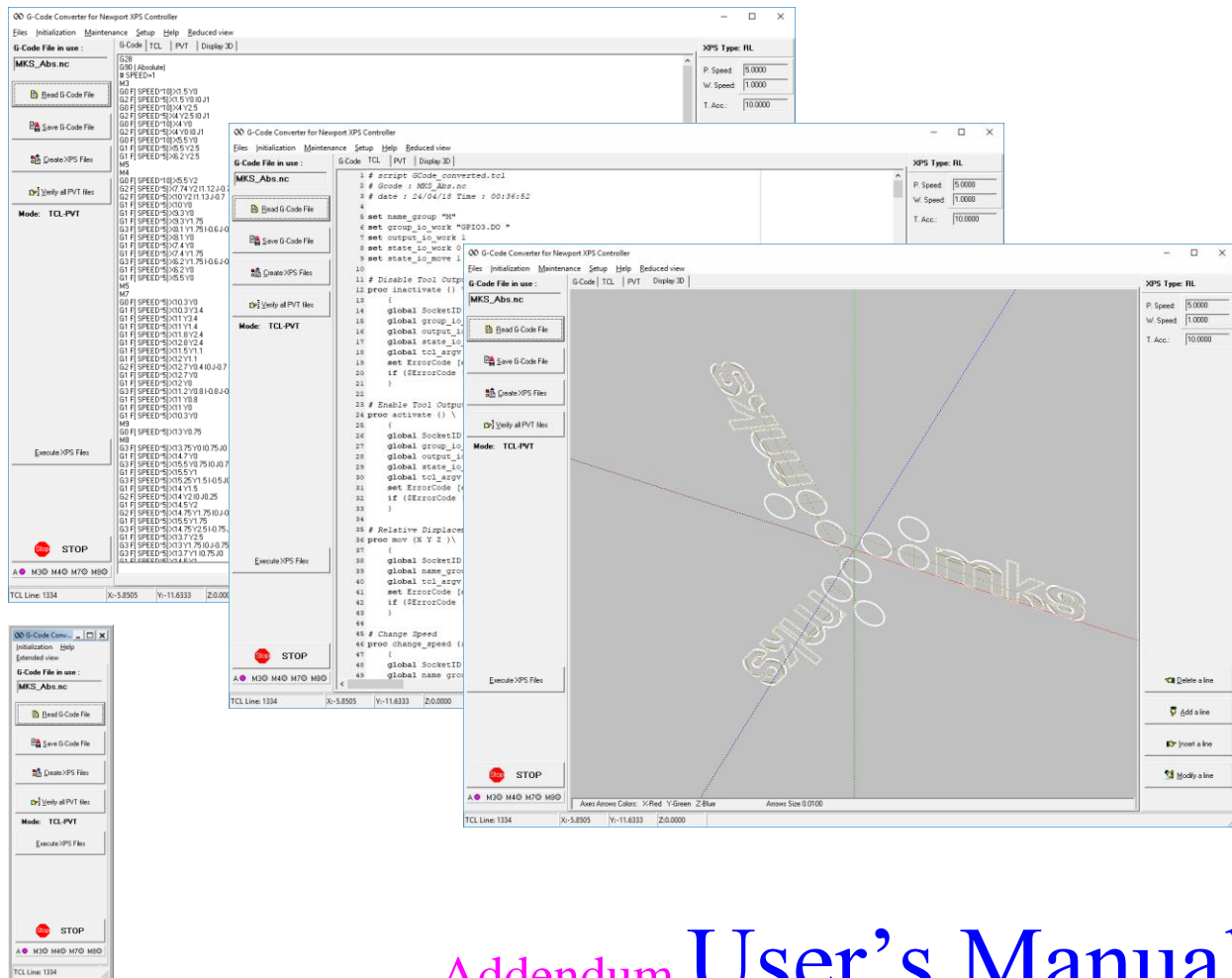


XPS_GCODE

G-Code CONVERTER for XPS Controller



Addendum User's Manual

V 2.03
December 2018

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1. VERSION 2.03 NEW FEATURES

1.1. XPS CONTROLLERS COMPATIBILITY

This version is compatible with all Newport XPS controllers: “C”, “Q”, “RL” and “D” in Windows XP, 7, 8 and 10 environments.

Note: Exception: XPS-D in Windows XP environment: Consult us.

At start, a new “Connection” window allows selecting the controller type.

1.1.1. CONNECTION WINDOW

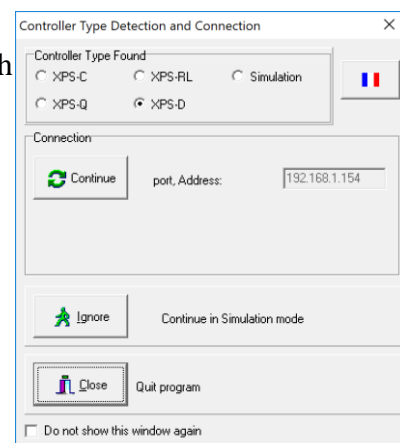
When launched for the first time, XPS_GCODE verifies the controller presence using the Port 5001 communication channel. Depending on this detection result, the connection window offers different choices:

1.1.1.1. CONNECTION ESTABLISHED

When XPS_GCODE can establish the connection with the XPS controller using the saved parameters (in the XPS_GCODE.INI file), the connection window appears displaying the detected XPS controller type and allowing:

- Connection to the detected port and address
- Running the program in simulation mode
- Quit XPS_GCODE

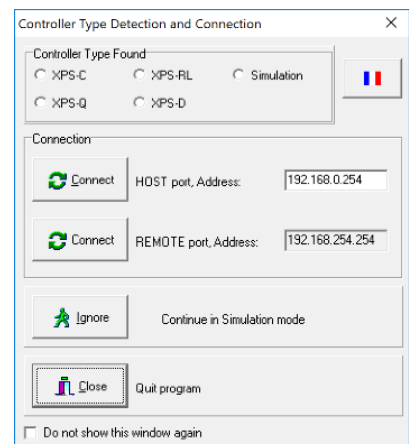
Note: checking the “Do not show this window again” box allows skipping this step when running XPS_GCODE the next time



1.1.1.2. CONNECTION NOT ESTABLISHED

When launching XPS_GCODE for the first time or when the connection with the controller cannot be established with the last used parameters (saved in the XPS_GCODE.INI file), after an error message (acknowledge it), a new window appears allowing the following:

- Connection through the HOST port after entering its address
- Connection through the REMOTE port
- Running the program in simulation mode
- Quit XPS_GCODE

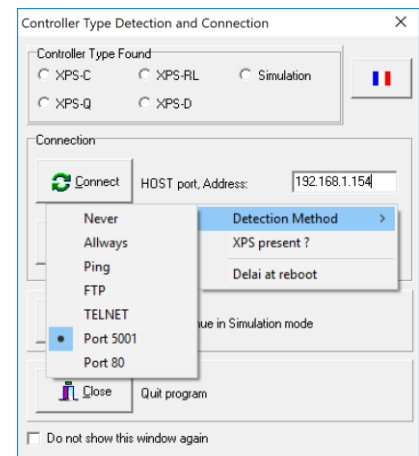


1.1.1.2.1. TROUBLESHOOTING

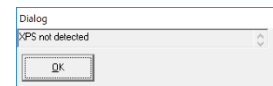
Although the Port 5001 communication channel will be ultimately use by XPS_GCODE, there is a possibility to change the detection method to verify that any firewall or anti-virus is not blocking the communication.

A right click on the Connection panel allows:

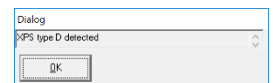
- Selecting the **Detection method** (**Never**, **Allways**, **Ping**, **FTP**, **TELNET**, **Port 5001** or **Port 80**)
- **XPS Present ?** verifies the presence of a controller at the selected address through the selected method. A message window informs



If the controller cannot be reached an error message appears. Check IP address...



Once the controller is detected, press the "Connect" button to access XPS-GCODE main window.



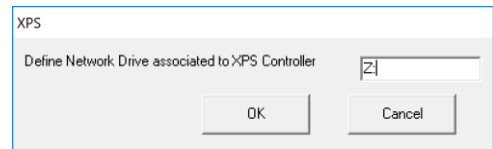
Notes:

- Controller can be determined only using the "Port 5001" method.
- Detection method is memorized in the XPS-GCODE.INI file and will be used at the next start
- Set a delay for the program to wait for controller rebooting is not used in XPS-GCODE

1.2. XPS-D PARTICULARITY

XPS-D controller scripts can be accessed directly from windows (7 and higher) through a mapped drive. (for XPS-D in Windows XP environment: Consult us)

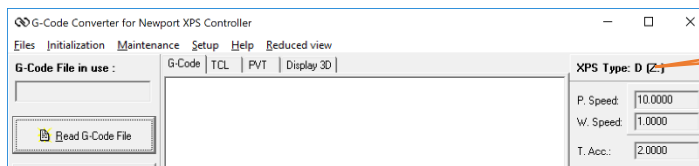
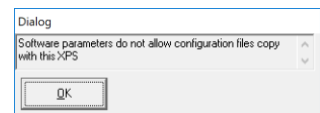
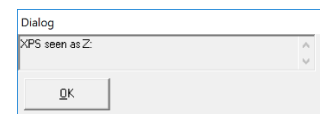
After detecting and connecting to a XPS_D XPS-GCODE will ask for the letter associated to the mapped drive through a new window (default: "Z:"). Enter the correct letter and press "OK".



If the drive can be accessed, XPS-GCODE starts.

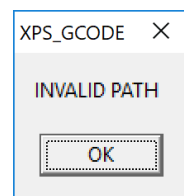
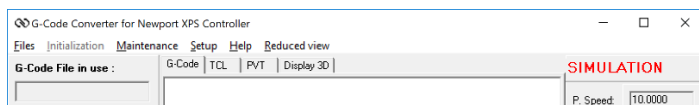
Note :

A message reminds you that this version of GCODE_XPS does not communicate through SFPD protocol therefore XPS configuration files cannot be accessed for maintenance purpose.



XPS type and mapped Drive

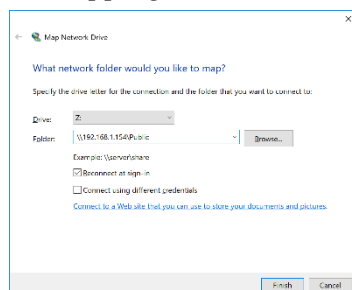
Otherwise, an error message appears and then XPS-GCODE runs in SIMULATION Mode.



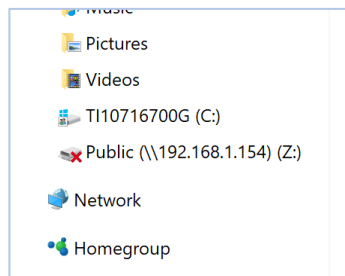
Note :

In case of error check the mapped drive state on your file explorer, you may have to re-connect it... (Especially when the controller has been rebooted...)

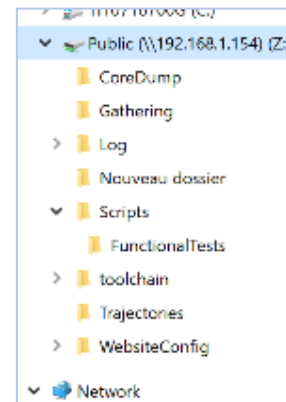
Mapping a XPS



Disconnected Drive



Connected Drive



1.3. G-CODE “M” COMMANDS / XPS OUTPUT ASSOCIATION

1.3.1. LIST OF AVAILABLE PORTS

XPS Type		C and Q						RL						D		
		Basic			Extended			Basic			Extended					
GPIO		Con.	Dig.	Ana.	Con.	Dig.	Ana.	Con.	Dig	Ana.	Con.	Dig.	Ana.	Con.	Dig.	Ana.
1	DI	37F	8		37F	8		25F	6+2 (sync)							
	DO		8			8			6+2 (sync)							
2	DI	25F	6	4	25F	6	12	9F		2						
	DO			4			4			2						
3	DI	15M	6		15M	6					37F	8		37F	8	
	DO		6			6						37F	8			8
4	DI	37M	16		37M	16					37F		8	37F		8
	DO		16			16						37F			8	
5	DI										50F	14+2 (sync)		50F	14+2 (sync)	
	DO											14+2 (sync)			14+2 (sync)	
6	DI										50F	16		50F	16	
	DO											16			16	

Note: Check controller user manual for pinout

1.3.2. XPS-GCODE IO SELECTION WINDOW

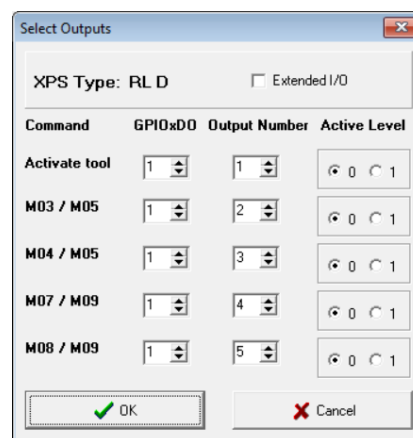
A new window allows associating XPS outputs to Tool Activation (A) and G-Code “M” commands.

The type of XPS connected is automatically displayed.

Depending on XPS type, the Extended I/O box appears and must be checked by the user according to the XPS actual configuration

Notes:

- Available ports and outputs are automatically set when checking/unchecking Extended I/O box.
- M3 and M4 set outputs which are reset by M5.
- M7 and M8 set outputs which are reset by M9.
- Default values: are shown in the picture.



1.4. ADDITIONAL COMMANDS

New commands have been added allowing rotation in a plan with:

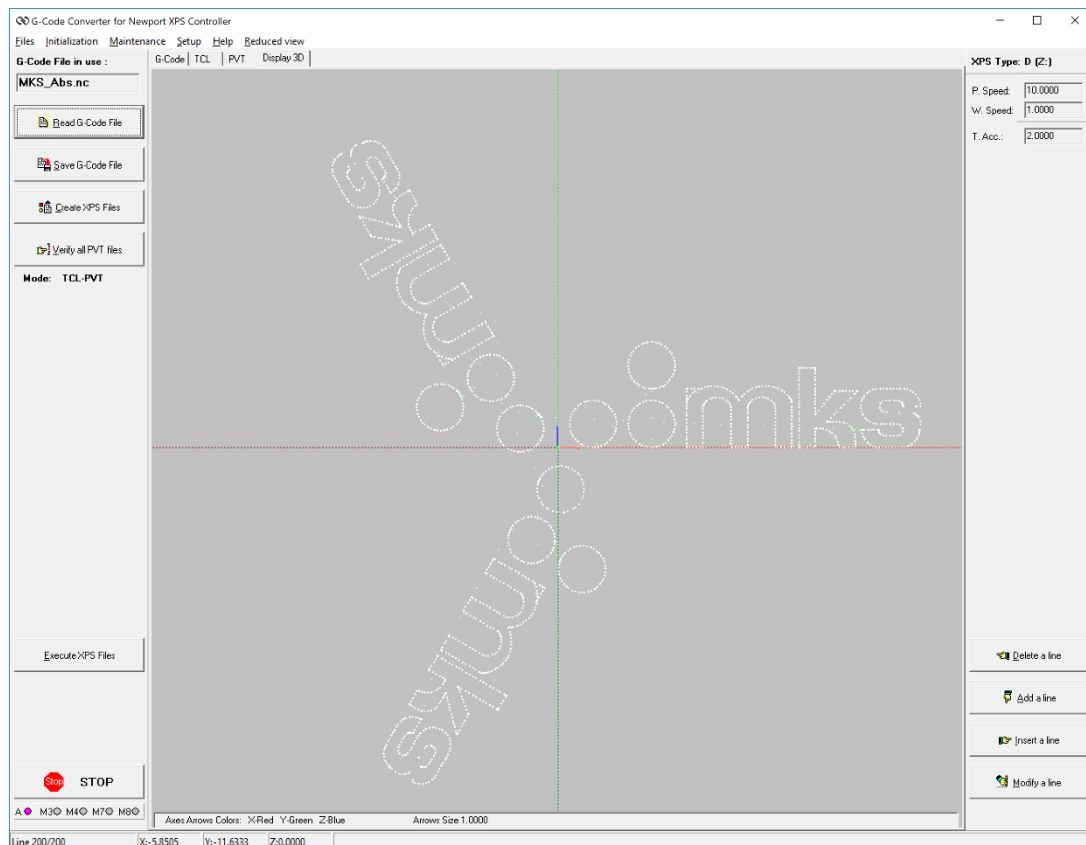
- **G17** allows selecting the XY-plane, **G18** the XZ-plane and **G19** the YZ-plane.
- **G68** allows selected coordinate system rotation with 3 parameters: A, B & R
 - A, B: Center of rotation absolute coordinates in the selected plan
 - R: Rotation angular value in Degrees (-360 to +360, + = counterclockwise)
- **G69** canceled this rotation

Examples:

- G17 G68 X50 Y100 R30
- G18 G68 X5 Z10 R-20

Notes:

**It's highly recommended to use the Absolute mode when using these commands.
Do not use G28 command whenever G68 has been activated.**



Example of G17 and G68 commands: The same “MKS” logo code is used a 2nd time after G68 X0 Y R120 command and a 3rd time after G68 X0 Y R120 command

1.5. AXES NAME

Although the (multi) group name can be set by the user, **positioners extensions must be “X, Y and Z”.**

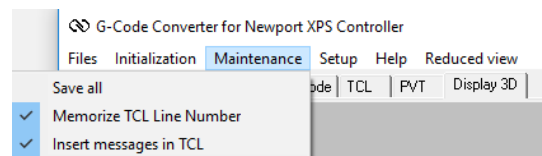
Example:

- Group Name: M
- Positioners: M.X, M.Y and M.Z

1.6. TROUBLESHOOTING

To help troubleshooting 2 new features are available through the maintenance menu:

- Memorize TCL line Number
- Insert Messages in TCL

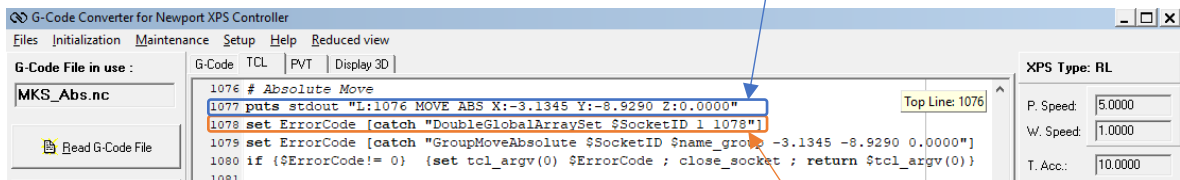


1.6.1. INSERT MESSAGES IN TCL

When checked, message lines (“puts stdout”) are inserted in the TCL script before (relative and absolute) moves and trajectory execution.

During the TCL execution, these lines can be read on a VGA monitor connected to the back of the controller.

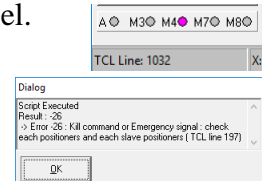
```
L:141 : MOVE ABS X:1.5000 Y:0.0000 Z:0.0000
L:155 : MOVE ABS X:5.5000 Y:2.5000 Z:0.0000
L:161 : MOVE ABS X:0.2000 Y:2.5000 Z:0.0000
L:187 : MOVE ABS X:-0.7000 Y:-0.5000 Z:0.0000
L:195 : TRAJ_PVT 1
L:205 : TRA5_PVT 1
L:221 : MOVE ABS X:10.0000 Y:0.0000 Z:0.0000
L:227 : MOVE ABS X:0.3000 Y:0.0000 Z:0.0000
L:233 : MOVE ABS X:0.3000 Y:1.7500 Z:0.0000
L:239 : TRA6_PVT 1
L:249 : MOVE ABS X:0.1000 Y:0.0000 Z:0.0000
L:255 : MOVE ABS X:7.4000 Y:0.0000 Z:0.0000
L:261 : MOVE ABS X:7.4000 Y:1.7500 Z:0.0000
L:267 : TRA7_PVT 1
L:277 : MOVE ABS X:0.2000 Y:0.0000 Z:0.0000
L:283 : MOVE ABS X:5.5000 Y:0.0000 Z:0.0000
L:309 : MOVE ABS X:4.0000 Y:0.0000 Z:0.0000
L:323 : MOVE ABS X:10.5000 Y:3.0000 Z:0.0000
L:329 : MOVE ABS X:11.0000 Y:3.4000 Z:0.0000
L:335 : MOVE ABS X:11.0000 Y:1.4000 Z:0.0000
L:341 : MOVE ABS X:11.0000 Y:2.4000 Z:0.0000
L:347 : MOVE ABS X:12.0000 Y:2.4000 Z:0.0000
L:353 : MOVE ABS X:11.5000 Y:1.1000 Z:0.0000
L:359 : TRA8_PVT 1
```



1.6.2. MEMORIZE TCL LINE NUMBER

When checked:

- Current TCL script line number is memorized in the XPS controller Double Global Array for moves and trajectory execution through an additional line in the TCL script. This number is also displayed in the status bar first panel.
- In case of error during the TCL execution, the last executed TCL line number is displayed at the end of the error message.



NOTE: These features slow down the TCL script creation and execution process. It is recommended to use them only for troubleshooting purpose.

1.7. PVT FILES

Due to XPS controller sampling frequency, the maximum duration for a Trajectory time element (DT) is limited to 1 millisecond.

1.8. STATUS BAR COLOR

Status bar background color turns orange while:

- Gcode file is read
- TCL, SCT and PVT files are created
- PVT files are loaded into the controller

All buttons are disabled during these actions

1.9. ABOUT

About window has been updated as follow:



2. ANNEXES

2.1. COMMANDS LIST

Recognized commands (version 2.0x)

G codes	Description	Notes
G0	Rapid Linear Motion	Default speed
G1	Linear Motion at Feed Rate	-
G2 & G3	Arc at Feed Rate	-
G4	Dwell Time in seconds	i.e. G4P1 for 1 s delay
G16, G17, G18	Plan Selection	G16: XY plan G17: YZ plan G18: XZ plan
G28	Return to Home	Move absolute 0,0,0
G53 & G90	Absolute Mode	-
G68	Rotation in the selected plan	For G16: Xxx Yyy Rrr (deg.) For G17: Xxx Zzz Rrr (deg.) For G18: Yyy Zzz Rrr (deg.)
G69	Cancels rotation	Cancels G68
G91	Relative Mode	-
M codes	Description	Notes
M3	Selectable XPS output ON	Reset by M5
M4	Selectable XPS output ON	Reset by M5
M5	Reset XPS outputs	M3 and M4
M7	Selectable XPS output ON	Reset by M9
M8	Selectable XPS output ON	Reset by M9
M9	Reset XPS outputs	M7 and M8
Other codes	Description	Note
F	Set Feed Rate	-
VARIABLES and calculations	Almost all mathematical functions...	-
N	Line numbers	No effect
(....)	Comment	No effect

Notes:

In case of missing parameter in a command, the last value will be taken in account

In case of multiple “G” commands on the same line, XPS-GCODE will separate them into different lines. It is then recommended to save the Gcode file for future use.

It’s highly recommended to use the Absolute mode when using G68 command.

Do not use G28 command whenever G68 has been activated.

2.2. XPS_GCODE.INI FILE

Example of Important parameters

Parameter	Value	Description	Note
[MAIN]		Main Chapter	Do Not Change
LANGUAGE=	2	1 : French, 2 : English	Default value
MODE DETECTION=	5		Default (port 5001)
EXTENDED_IO=	0	1 : Yes, 0 : No	Default value
MODE=	TCL-PVT	Conversion mode	Default value
DISK XPS=	Z:	Mapped Drive	Default value
[XPS]		Chapter	Do Not Change
TYPE=	D	Controller Type	Depends on XPS
[TCP-IP]		Chapter	Do Not Change
ADR IP=	192.168.0.254	Current IP Address	Default value
[HELP]		Chapter	Do Not Change
FILE=	XPS_GCODE_Help.pdf	Help file name	Default value
[FTP LOGIN]		Chapter	Do Not Change
USER=	Administrator	Default	Do Not Change
PASS=	Administrator	Default	Do Not Change
[POSITIONER NAME]		Chapter	Do Not Change
AXIS X=	M.X	Axes default names	Must be a « Multi » type of group
AXIS Y=	M.Y		
AXIS Z=	M.Z		
[SPEED]		Chapter	Do Not Change
POSITIONNING=	5		Default value
WORKING=	1		Default value
USE F CODES=	0	1 : Yes, 0 : No	Default value
[TRAJECTORY]		Chapter	Do Not Change
ACCELERATION=	2		Default value
[Multi.X]		Chapter	Axes parameters, Do not change
[Multi.Y]		Chapter	
[Multi.Z]		Chapter	
[ACTIVATE]		Chapter	Do Not Change
GROUP=	1	GPIO #	Tool Output parameter
OUTPUT=	1	Bit #	
SENSE=	1	Active Level	
[M03M05]		Chapter	Idem for M3 output
[M04M05]		Chapter	Idem for M4 output
[M07M09]		Chapter	Idem for M7 output
[M08M09]		Chapter	Idem for M8 output

3. REFERENCES

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