PMC Precision MicroControl Corp.

TechNOTE

Title: MultiFlex ETH 1000 Series G-Code Processing
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Summary

PMC's MultiFlex ETH 1000 Series motion controllers provide a set of convenient mechanisms to support the transfer and processing of large amounts of data contained in multiple files typically required in CNC G-code applications. The procedure described in the following section can be used as a prototype for creating, loading and executing the files required to implement such an application.

More Information

FTP File Transfer Procedure

The MultiFlex ETH 1000 Series controllers feature an embedded FTP server for file transfer to and from the controller. It can be accessed by a remote FTP client with the default address of 192.168.1.100

The controller file system has the following hierarchy

/dev
/etc
/web
/update
/home
/home/user

MCCL macro files and CNC G-code configuration and part files should be transferred to the /home/user directory to allow visibility to the main command processor and CNC interpreter on the controller.

Files can be transferred to the controller in a number of ways, either through the use of a graphical FTP client like Windows Explorer, FileZilla, etc. or invoking the client by command line. The latter method will be discussed here since it lends itself to integration into a user application developed using the PMC Motion Control API. Following are two examples that demonstrate single and multiple file transfers by command line.

Single data file transfer

```
ftp 192.168.1.100
cd home\user
put <data1.mfx1>
```

The data file will now reside in the controller file system

```
home/user/data1.mfx1
```

Multiple data file transfer

Multiple files can be transferred by passing a script to the FTP client, using the following syntax:

```
ftp -s:ftp_cmd.txt 192.168.1.100
```

The ftp_cmd.txt script file contains the following lines:

```
cd home/user
put data_1.cmd
put data_2.cmd
put data_3.cmd
put data_4.cmd
quit
```

MFX File System Utilities

Commands that are relevant to the controller file system can be issued from a Telnet command line, such as WinControl, using the following syntax:

DL"/home/user"	lists contents of /home/user directory to console
TY"/home/user/fname.dat"	displays /home/user/fname.dat to console
EC"<fname.dat>"	macro processing - sends contents of /home/user/name.dat to system command processor (file should consist of valid MCCL commands)

G-code File Processing Procedure

The basic steps described in the previous section can be also be applied to G-code part files, configuration files, tool files and work files. After transferring these data files to the controller via FTP to the /home/user directory, the appropriate MCCL commands can be used to invoke the code:

- RUFn run part file
- RCFn run configuration file
- RWFn run work file
- RTFn run tool file

Note that these commands take integer file numbers as parameters so the files must be named appropriately when transferred to the controller. This can be accomplished in the ftp command script file. For example, the following CNC data files have been created and need to be transferred to the controller and will be reassigned to the following numeric filenames

host filename	controller filename
part_file1.dat	1
part_file2.dat	2
config_file1.dat	10
work_file1.dat	50
tool_file1.dat	100

This can be accomplished with the following ftp command script:

```
cd home/user
put part_file1.dat 1
put part_file2.dat 2
put config_file1.dat 10
put work_file1.dat 50
put tool_file1.dat 100
quit
```

The files can then be passed to the G-code processor with the following commands

```
rcf10   ; run CNC configuration file
rwf50   ; run CNC work file
rtf100  ;  run CNC tool file
ruf1    ; run CNC part program 1
ruf2    ; run CNC part program 2
```