



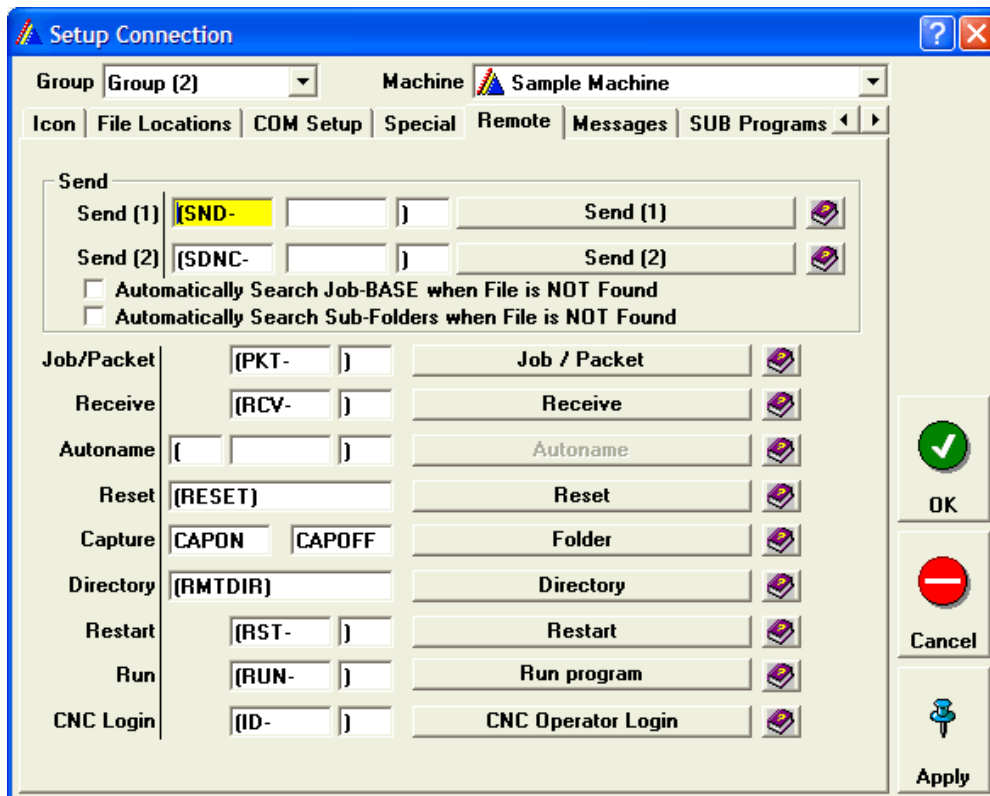
RICHMOND MACHINE & ENGINEERING

Presents:
The **Remote** Feature of **MULTI-DNC** for Windows™

Remote mode is one of the most useful functions of **Multi-DNC**. **Remote** allows CNC operators to send, receive, run “drip feed” DNC communications and execute other functions directly from their CNC controls without having to walk back to the DNC computer. The CAD/CAM programmer is not interrupted by CNC operators asking for tapes, or to send and receive CNC programs from the

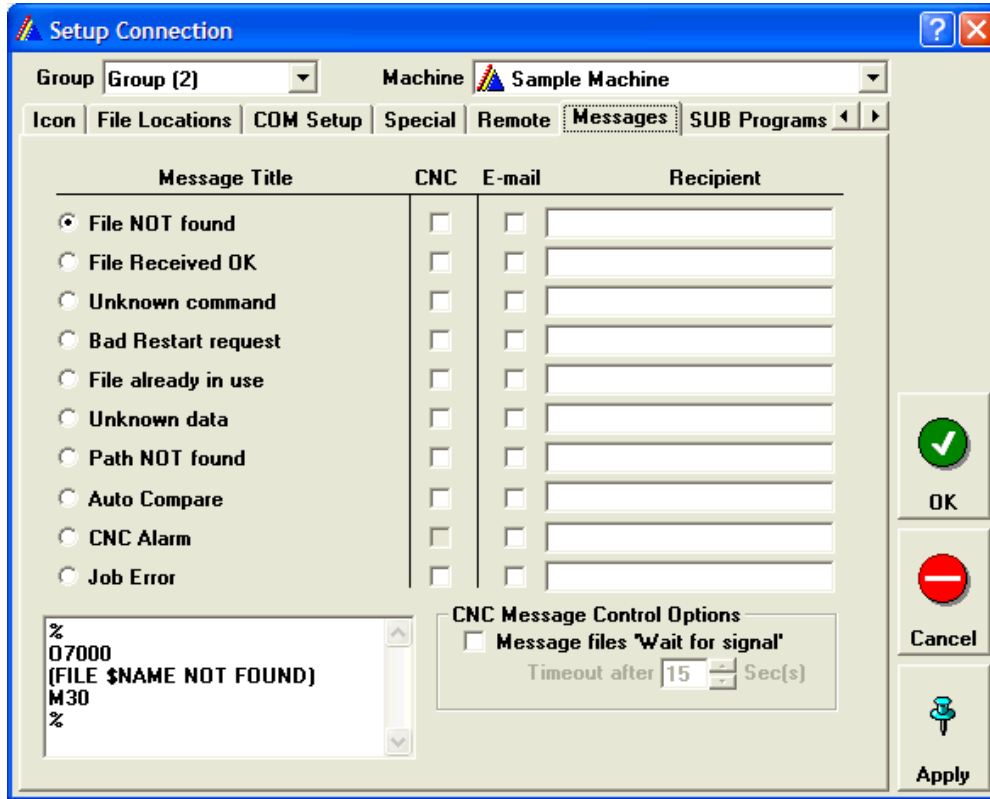
CAD/CAM workstation. A tremendous amount of time can be saved by **both** programmers **and** CNC operators. When a Machine Connection is in **Remote** mode, the COM port is set to “**scan**” for a certain sequence or “**string**” of characters associated with the legal file name of a requested file. This particular string of characters triggers **Multi-DNC** to either find the single requested

program and send it to the CNC control **or** to store the program that is being received as it comes in from the CNC control, as well as several other functions. The following dialogs set up all of the **Remote** parameters, which can be different for **each** Machine Connection in any **Multi-DNC** system.



Each Remote Function has its own Configuration Menu and Help screens

- ### There are 11 separate Remote functions
- Send is the string of characters that precedes a single file name when you request a file **from** the DNC computer. **TWO** separate **Send** Commands that can be used, and two options search for the requested file in either the **Job BASE** database or search sub-folders automatically.
 - Job/Package** is the string of characters that precede the packet name (or the Job name setup in the **Job BASE** database) when you request it **from** the DNC computer.
 - Receive** is the string of characters that sets up a file name **before** you send a file **to** the DNC computer for storage.
 - Autoname** is a secondary method to receive files at the DNC computer. The filename is **embedded** in the CNC program itself.
 - Reset** is the string of characters that resets the Remote function directly from the CNC control.
 - Capture** is the string of characters that precedes data output from CNC controls or other devices such as **measuring probes**.
 - Directory** is the string of characters that commands **Multi-DNC** to send back a current directory **listing** of available files to the CNC control.
 - Restart** sets up the string of characters that precede the command to tell **Multi-DNC** to “**backup**” and then re-send a file.
 - Run** lets you **start a program** on the DNC computer using a Remote Command sent from the CNC control.
 - CNC Login** sets up the string of characters that **identifies** the CNC operator to the **Multi-DNC** system for purposes of Machine Monitoring.



Messages help the CNC Operator when using the Remote functions

Ten Messages can be sent to the CNC or to E-mail

Messages are pre-done blocks of text normally formatted as CNC programs that are optionally sent back to the CNC control or to an e-mail recipient when certain events occur. Messages can be formatted differently for each CNC control with optional Message variables. And, **ALL** Messages are always sent to the **Multi-DNC** Event Log.

- ⇐ **File NOT found Message** is sent back to the CNC control when the requested file does not exist.
- ⇐ **File Received OK Message** is sent back to the CNC control after a file has been successfully stored and named at the DNC system. Variables can be used to show the file information.
- ⇐ **Unknown command Message** is sent back to the CNC control when the syntax of the Remote Command partially matches, but the DNC system cannot resolve the request.
- ⇐ **Bad Restart request Message** is sent back to the CNC control when the syntax of the Restart request is incorrect.
- ⇐ **File already in Use Message** tells the CNC operator that a requested file is in use, usually because it is open in the **Editor**.
- ⇐ **Unknown Data Message** is sent back to the CNC control when the DNC system cannot resolve the request because it is totally garbled.
- ⇐ **Path NOT found Message** is sent back when the partial path requested in a Remote Command does not exist.
- ⇐ **Auto Compare Message** is sent back when the Auto Compare switch is on and two files have been compared in the background. A "difference" report is also automatically sent to an e-mail recipient.
- ⇐ **CNC Alarm Message** is sent to e-mail only when Alarm occurs on CNC controller. Currently supported for Fagor 8010-8020-8030 Controllers.
- ⇐ **Job Error Message** tells the CNC operator about (5) possible problems when a Job made in **Job BASE** is called from **Remote**.

Receiving Files at the CNC control from Multi-DNC

To receive a file at the CNC control in the **Remote** mode, the CNC operator creates a small program similar to these two examples:

```
%
O3333
(SND-1234)
M30
%
```

This program requests a file named "1234" in the Machine Connection's Send folder on the DNC computer. The file extension is pre-set as "*.NC". The CNC operator "punches" out this program, when it is done, he gets the CNC control ready to "read" and 1234.NC is sent back after the pre-set delay time. This method works on all CNC controls that can type in alpha-numeric characters inside comments.

```
%
O8000
/F123456
M30
%
```

This Command program requests a file named 123456.NC in the DNC computer's Send folder for this Machine Connection. It is stored as a separate program name (O8000) on the CNC control (like a sub-program) and is edited and reused each time for **Remote**. The string of characters " /F " can be configured to any string, but it should be a non "move" code to avoid any problems if this sub-program is accidentally run.

The CNC operator then "punches" out the small program to the DNC system, it finds the requested file, then sends that file back after an appropriate delay to let the CNC operator get ready to receive it into memory or set up to do Direct DNC (Drip Feed) at the CNC control.

Receiving Files at the CNC control from Multi-DNC (continued)

```
%  
O7000  
(SND-C:\DNC\FADAL\PART-4454-321A)  
(PUNCH O7000, WAIT 5 SEC, TYPE TA,1)  
M30  
%
```

A partial or full path can be specified (for either local or network drives) if the file is in a different place than the pre-set path.

This O7000 Command program requests a file named "**PART-4454-321A.NC**" from the DNC computers **C:\DNC\FADAL** directory, which is different from the pre-set path. If just the file name is given in a **Remote** Send request, it is automatically sent from the Machine Connection's Send folder. **Remote FULLY** supports all Windows 32 bit operating system "long" file names.

Also note the instructions for the CNC operator. The previous examples shown were referenced to Fanuc and Fadal controls, but **Remote** will work on **ANY** CNC control that can store more than one program. If your CNC control keypad does not have the "\ " and " : " characters, use " / " and " # " and they will automatically be substituted. And **Remote** can even work on those CNC controls that cannot use Comments by implementing optional Hand Held Terminals or Bar Code Readers.

Sending a directory listing back to the CNC control

Another feature of **Remote** is the ability to receive a directory listing at the CNC control of all of the files that are available for downloading. To do this, the CNC operator punches a small program like this:

```
%  
O8000  
(RMTDIR)  
M30  
%
```

The "**RMTDIR**" command sent to the DNC system will return a program to the CNC control that shows all of the programs that the operator can download. This is a listing of all of the programs in the Machine Connection's Send folder with each program listed on a line by itself. Optional variables can also show each files size and last date saved.

```
%  
O1234  
(16-22-40-REV1.NC)  
(BAR.NC)  
(O4569.NC)  
(OPERATION#12.NC)  
and so on for the entire  
"Send" folder.....
```

This file name listing shows all of the files in the Send folder that match the pre-set file mask of "***.NC**". Also shown is a mixed combination of "short" 8.3 format file names and "long" file names that are now possible in 32 bit operating systems. A "template" can be created for each Machine Connection to format the Directory output file correctly for that particular CNC control.

When the CNC operator receives the list of multiple files, he adds a block delete character " / " in front of the single or multiple files that he wants to download, and punches the **O1234** program back to **Multi-DNC**. The DNC program then sends back those files to him. **Multi-DNC** can have two different **Remote** Send commands, one for getting a single file, and one for this multiple file situation.

Using a "Wildcard" Send Command

```
%  
O7001  
(SND-105)  
M30  
%
```

Another option for **Remote** is to send a "partial" or "wildcard" Send Command. In the example on the left, if just a single file existed that started with " **105** " then it would be sent. If more than one file started with " **105** ", then a list of those files would be sent to the CNC control as a formatted program as shown on the right.

```
%  
O8001  
(105621.OP1)  
(105621.OP2)  
(105624.NC)  
And so on.....
```

Using a “Wildcard” Send Command (continued)

```
%  
O8001  
/(105621.OP1)  
(105621.OP2)  
/(105624.NC)  
And so on.....
```

When the CNC operator receives the list of multiple files, he adds a block delete character “/” in front of the single **or** multiple files that he wants to download, and punches the O8001 program back to **Multi-DNC**. The DNC program then sends back those files to him. Two different strings of characters can also be sent before each Send command. This allows the use of embedding either “**TA,1**” or “**DNC**” strings before sending programs to a **Fadal** control to automatically put it in either Memory or Direct DNC (Drip Feed) mode.

Sending a file to Multi-DNC in Remote for storage

The CNC operator just needs to punch out the program to **Multi-DNC** in the normal way; if the DNC computer is setup in **Remote** for that Machine Connection, the Autaname function will automatically name the received file on the DNC computer and save it to the Machine Connection’s Receive folder. The file will be named according to the first comment like this:

```
%  
O5523  
(4623.TXT)  
N1 G0 G90 G80 G40  
N2 G43 Z 2.0  
Rest of CNC code.....
```

Using Autaname, the file on the left will be stored as “**4623-2.TXT**” If your CNC control can’t use comments, then using “**O**” for Autaname as on the right will also work and store the program as “**1234**” This also works if the CNC control output is “**:1234**” and it also can be set up to be stored as “**O1234**”, by adding the “**O**” to the file name.

```
%  
O1234  
N1 G0 G90 G80 G40  
N2 G43 Z 2.0  
Rest of CNC code.....
```

Sending other data to Multi-DNC and New Remote options

Remote can also be used to capture and store other types of data that can be output from CNC controls, such as formatted values output from probing macros or SPC gage output, as long as the data is preceded by the string of characters specified in the **Capture** section of the **Remote** dialog. **Remote** has new Sending options that allow you to start a Send at a specified Line number or at a Tool change point, or send a file a multiple number of times. **Remote** can now “redirect” its Commands so that certain CNC controls such as some models of Fanuc 0 can use **Remote** even though they cannot edit Comments at the control. **Remote** can also now be set up to automatically search all sub-folders below the preset path for the requested file name, which enables complex Windows folder arrangements for file management.

New - Remote Commands by E-mail

New to **Multi-DNC v7.0** is the ability to accept Remote Commands sent in from external devices using E-mail. **Multi-DNC v7.0** can now both Send and Receive E-mail for use in Messages as well as Remote Commands sent from external devices such as cellular phones, Blackberry pagers and PDA’s. Both POP 3 Mail Servers (for receiving) and SMTP Mail Servers (for sending) E-mail are supported.

Because all of the **Multi-DNC** products have a powerful 32 bit multi-threaded communications “engine” that enables true multi-tasking, any CNC controller that is connected can request a file at any time. No switches to change, no tapes to find, no more interruptions of your programmer to get the next job, no more coffee breaks to get a program, and no more yelling across the shop to get a new program. Production shops that may never use the direct DNC (drip feed) mode of communication need **Multi-DNC** just for **Remote**. And in fact, over 40% of our customers buy the **Multi-DNC** software just for **Remote**. If you have any questions regarding **Remote** or any other of the features of **Multi-DNC**, please contact Spectrum CNC Technologies for the name of your local representative.