The following information is provided to assist the user in the setup of a ProTalk PTQ-DFNT module and an Allen Bradley PowerFlex 70 drive using a 20-COMM-E module.

DRIVE SETUP

For this application, the ProTalk PTQ-DFNT module was operating as an Ethernet I/P client, while the 20-COMM-E module was setup as the Ethernet I/P server.

DataLinks A1-D2 were utilized to transfer the data from the PowerFlex 70 drive to the ProTalk PTQ-DFNT module.

Below is the configuration of the 20-COMM-E as seen using Drive Executive:

Linear List

#	Parameter Name	Value	Units	Internal Value
1	DPI Port	5		5
2	DPI Data Rate	125kbps		0
3	BOOTP	**Disabled**		**0**
4	IP Addr Cfg 1	**192**		**192**
5	IP Addr Cfg 2	**168**		**168**
6	IP Addr Cfg 3	**0**		**0**
7	IP Addr Cfg 4	**120**		**120**
8	Subnet Cfg 1	**255**		**255**
9	Subnet Cfg 2	**255**		**255**
10	Subnet Cfg 3	**255**		**255**
11	Subnet Cfg 4	**0**		**0**
12	Gateway Cfg 1	**0**		**0**
13	Gateway Cfg 2	**0**		**0**
14	Gateway Cfg 3	**0**		**0**
15	Gateway Cfg 4	**0**		**0**
16	EN Rate Cfg	**Autodetect**		**0**
17	EN Rate Act	100Mbps Full		3
18	Ref / Fdbk Size	16-bit		0
19	Datalink Size	16-bit		0
20	Reset Module	**Ready**		**0**
21	Comm Flt Action	**Fault**		**0**
22	Idle Flt Action	**Fault**		**0**
23	DPI I/O Cfg	**00011111**		**31**
24	DPI I/O Act	00011111		31

These settings set the IP address of the 20-COMM-E module to 192.168.0.120. This will be the address used within the configuration file for the ProTalk PTQ-DFNT module.

Within the configuration of the drive, several parameters had to be setup to allow for control of the drive by the PTQ-DFNT module, as well as select what data will be available to the ProTalk module using the DataLinks section of the drive. Below is the configuration needed to accept a speed reference from the ProTalk module:

Linear List

#	Parameter Name	Value	Units	Internal Value
90	Speed Ref A Sel	DPI Port 5		22

As well as having to setup the Speed Reference, Logical masks also needed to be setup to allow for Start, Stop, Jog, Shuttle commands from the PTQ-DFNT module. Below is the configuration of these logical masks. This allows for DPI Port 5 (communication port for the 20-COMM-E module) to accept commands for the drive:

Linear List

#	Parameter Name	Value	Units	Internal Value
276	Logic Mask	0000000000100010		34
277	Start Mask	0000000000100010		34
278	Jog Mask	0000000000100010		34
279	Direction Mask	0000000000100010		34
280	Reference Mask	0000000000100010		34
281	Accel Mask	0000000000100010		34
282	Decel Mask	0000000000100010		34
283	Fault Clr Mask	0000000000100010		34
284	MOP Mask	0000000000100010		34
285	Local Mask	0000000000100010		34

And finally, the datalinks portion of the drive was required to allow for the ProTalk module to read data from the drive. The setup used for this testing was as follows:

Datalinks Group Parameters

#	Parameter Name	Value	Units	Internal Value
300	Data In A1	0		0
301	Data In A2	0		0
302	Data In B1	0		0
303	Data In B2	0		0
304	Data In C1	0		0
305	Data In C2	0		0
306	Data In D1	0		0
307	Data In D2	0		0
310	Data Out A1	6		6
311	Data Out A2	10		10
312	Data Out B1	12		12
313	Data Out B2	13		13
314	Data Out C1	27		27
315	Data Out C2	28		28
316	Data Out D1	29		29
317	Data Out D2	41		41

Drive Addressing

The following table from Allen Bradley's 20-COMM-E user manual, section C-16 shows the addressing of the datalinks parameters and speed/control parameters within the drive:

N-File	Description	
N41	This N-file lets you read and write control I/O messages. You can write control I/O messages only when all of the following conditions are true: • The adapter is not receiving I/O from a scanner. For example, there is no scanner on the network, the scanner is in idle (program) mode, the scanner is faulted, or the adapter is not mapped to the scanner. • The adapter is not receiving Peer I/O from another adapter. • The adapter is configured to receive I/O (for example, the [DPI I/O Cfg] parameter). • The value of N42:3 is set to a non-zero value.	
	Write	*Read*
N41:0	Logic Command Word	Logic Status Word
N41:1	Reference (least significant word)	Feedback (least significant word)
N41:2	Reference (most significant word)	Feedback (most significant word)
N41:3	Datalink A1 (least significant word)	Datalink A1 (least significant word)
N41:4	Datalink A1 (most significant word)	Datalink A1 (most significant word)
N41:5	Datalink A2 (least significant word)	Datalink A2 (least significant word)
N41:6	Datalink A2 (most significant word)	Datalink A2 (most significant word)
N41:7	Datalink B1 (least significant word)	Datalink B1 (least significant word)
N41:8	Datalink B1 (most significant word)	Datalink B1 (most significant word)
N41:9	Datalink B2 (least significant word)	Datalink B2 (least significant word)
N41:10	Datalink B2 (most significant word)	Datalink B2 (most significant word)
N41:11	Datalink C1 (least significant word)	Datalink C1 (least significant word)
N41:12	Datalink C1 (most significant word)	Datalink C1 (most significant word)
N41:13	Datalink C2 (least significant word)	Datalink C2 (least significant word)
N41:14	Datalink C2 (most significant word)	Datalink C2 (most significant word)
N41:15	Datalink D1 (least significant word)	Datalink D1 (least significant word)
N41:16	Datalink D1 (most significant word)	Datalink D1 (most significant word)
N41:17	Datalink D2 (least significant word)	Datalink D2 (least significant word)
N41:18	Datalink D2 (most significant word)	Datalink D2 (most significant word)
N42	This N-file lets you read and write some values configuring the port	
N42:3	Time-out (read/write): Time (in seconds) allowed between messages to the N41 file. If the adapter does not receive a message in the specified time, it performs the fault action configured in its [Comm Flt Action] parameter.	

ProTalk Client Configuration

As an Ethernet I/P client, the ProTalk PTQ-DFNT module will issue only PCCC messages. For this reason, the CIP addressing scheme of the drive is not supported. The PCCC messaging will allow for the ProTalk module to pull data from the N file of the drive.

Below is the configuration file used within the ProTalk module to poll this data from the 20-COMM-E module and place this information into the database of the ProTalk PTQ-DFNT module. This information will later be taken from the ProTalk database and transferred over to the Quantum processor.
This is the configuration used to poll the data:

```
[DFNT Client 0 Commands]
#
# The file contains examples for a ControlLogix processor with the N7 file
# configured.  This example uses SLC and PLC5 commands.
#
# LOCATION      :
# DATE          : 04/05/2000
# CONFIGURED BY : RAR
# MODIFIED      :
#
#   1     2      3     4    5  6                   7    8      9     10   11   12
#        DB   Poll       Swap                         Func   File  File  Elm  Sub
#Enab  Addr  Delay Count Code  Node IP Address Slot   Code   Type   #    #    Elm
START
  1      0      0    19    0  192.168.0.120    0       502    N    41    0    0    #Read Status word and datalinks A1-D2 from PowerFlex Drive
  1    100      0     1    0  192.168.0.120    0       510    N    41    0    0    #Write Logical Control Word to PowerFlex Drive
  1    101      0     2    0  192.168.0.120    0       510    N    41    1    0    #Write Reference (2 words LSW, MSW)
  1    103      0     1    0  192.168.0.120    0       510    N    42    3    0    #Write timeout value to PowerFlex Drive (must be a value >0)
```

Command #1 – Reads 19 words of information from the N41 file and places this information into DB address 0 of the ProTalk module. This information is then later sent over to the Quantum processor using command #1 within the “backplane data exchange” section of the configuration file. These 19 words included the speed reference, control word, and datalinks A1-D2 as setup in the configuration of the drive.

Command #2 – This command will write the logical control word out to the PowerFlex drive.

Command #3 – The command will write the speed reference out to the drive. The value written out to the drive is obtained from the ProTalk module at internal address 101 of the module memory.

Command #4 – This command is responsible for writing the timeout parameter to the drive. This value must be a value > 0 otherwise the drive will not accept any control commands from the ProTalk module.

ProTalk Backplane Exchange

Now that the configuration for the communication from the ProTalk PTQ-DFNT module and the PowerFlex 70 (via the 20-COMM-E) module is all setup, the next step is to exchange data between the Quantum processor and the PTQ-DFNT module. The ProTalk module is unique in the fact that is can directly read/write data to/from the Quantum processor. The setup of this configuration is done in the "Backplane Data Exchange" section of the configuration file, shown below:

```
# This section is used by the ProTalk module to define the data transferred between
# the module and processor.
#
# Cmd Type      --> 0=Disable, 1=Quantum to ProTalk, 2=ProTalk to Quantum, 3=Control
#                   data block for module
# DB Address    --> address of starting word in module database
# Point Type    --> 0=0x, 1=1x, 3=3x and 4=4x
# Point Address --> point address (1 based)(0x and 1x must be at start of word
#                   (i.e., 1, 17, 33, ...))
# Word Count    --> number of words to transfer (1 to 130)
#

[Backplane Data Exchange]
#   Cmd         DB       Point       Point      Word
#  Type    Address        Type     Address     Count
START
      2          0           4        1001        19    #move drive data from ProTalk to Quantum
      1        100           4        1101         4    #move command register from Quantum to DFNT module
END
```

Command #1 – This command transfers 19 words of data from the ProTalk module (DB address 0 – 18) and places this information into the Quantum processor at address 401001.

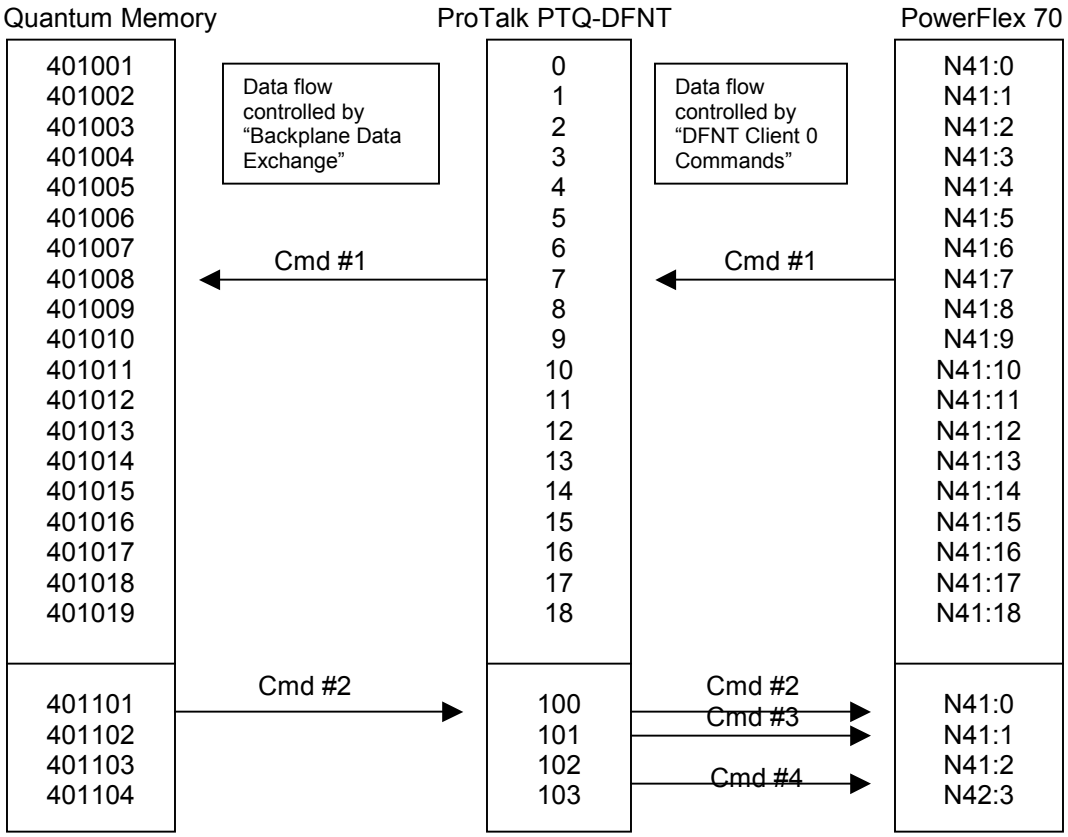
Command #2 – This command will take 4 words of data from the Quantum processor addresses 401101-401104 and place this information in DB address 100-103 of the ProTalk module memory.

Below is the screen capture of the data within the Quantum processor:

RDE Template (FLEXDRV.RDF) - Animation OFF

	Variable Name	Data Type	Address	Value
1			401001	0000111100001111
2			401002	0
3			401003	8952
4			401004	0
5			401005	1272
6			401006	0
7			401007	0
8			401008	0
9			401009	3288
10			401010	0
11			401011	3288
12			401012	0
13			401013	2400
14			401014	0
15			401015	22
16			401016	0
17			401017	2001
18			401018	0
19			401019	2300
20				
21			401101	0000000000000010
22			401102	0
23			401103	8952
24			401104	15

Data Flow



Revisions

The above testing was done using the following revisions:

PTQ-DFNT: Version 1.14
PowerFlex 70: Version 2.001
20-COMM-E: Version 2.001

Note: Communication faults were observed when using 20-COMM-E module version 1.003. COMM-E module would stop communication and would not respond to a ping request. After upgrading of firmware on 20-COMM-E module no faults occurred.