Overview of Utility & Example Ladder Programs

Electro Cam Corp. has developed the following three types of ladder program for use with the PL-1746 products:

Configuration
These programs provide a way to back up PL-1746 configuration data (all data other than pulse data).
See descriptions below.

Pulses
These programs provide a way to back up PL-1746 pulse data. See descriptions below.

Example
These programs provide examples of ladder programming for modifying PL-1746 configuration and pulse data while in run mode. These examples can be followed, for example, when making HMIs operate with the PL-1746.

The following chart shows which program sets are used with which PLS models.
Note: A version number, such as 200, may follow the filename and precede the .rss filename extension.

Program Set	PLS Models
C01 & C04 Configuration.rss C01 & C04 Pulses.rss C01 & C04 Example.rss	PL-1746-C01-R1 PL-1746-C04-R1
C02 & C03 Configuration.rss C02 & C03 Pulses.rss C02 & C03 Example.rss	PL-1746-C02-R1 PL-1746-C03-R1 PL-1746-C02-E1 PL-1746-C03-E1
C02 & C03 -S Configuration.rss C02 & C03 -S Pulses.rss C02 & C03 -S Example.rss	PL-1746-C02-R1-S PL-1746-C03-R1-S PL-1746-C02-E1-S PL-1746-C03-E1-S

Note: To obtain copies of RX-Logix programs, please contact Electro Cam Corp. by phone (1-800-228-5487) or email (ecam@electrocam.com).

C01 & C04 Configuration.rss

Included with these instructions you will need the RS Logix 500* PLC program C01 & C04 Configuration.rss. This program provides a way to read controller configuration from the PL-1746, as well as a configuration storage medium, to use the same configuration for more than one controller. This program is intended for use with RS Logix 500 software, PL-1746 PLμS Plug-In Module, and SLC CPU 5/03 or higher. No input or output cards are necessary for this program to run properly. The only requirement is that the SLC CPU is in Slot 0 and the PL-1746 is in Slot 1 (You must change all address if module is in another slot).

Prior to downloading and running the program, it must be configured for your setup the same way as described in the C01 & C04 Example.rss PLC program initialization. Once the program has been configured and downloaded, use these instructions to assist in setpoint reading and storage. The CDM shown below is the operational interface for setpoint reading and restoration. This program is intended to be used in conjunction with the PLC program C01 & C04 Pulses.rss to read all information from the controller.

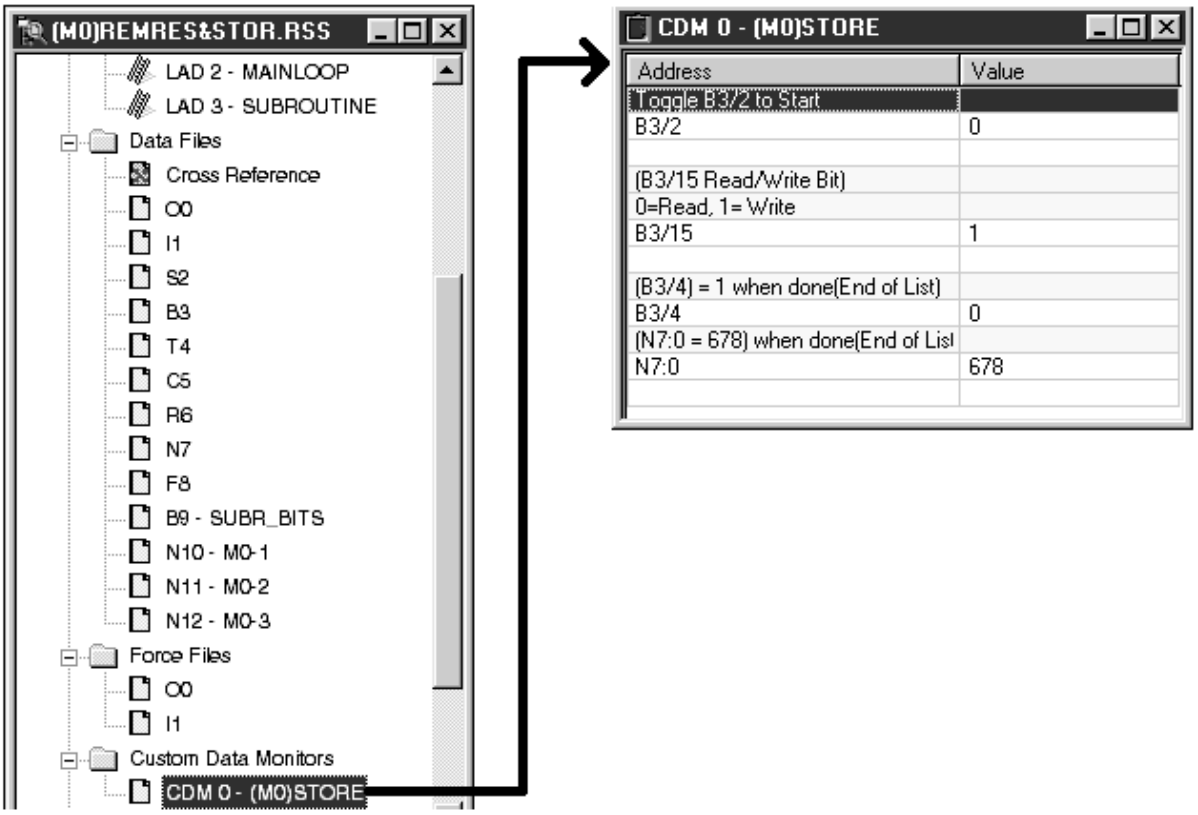
*RS Logix 500 and RS Linx are registered trademarks of Rockwell Software, Inc.

"Read" Configuration from PL-1746 to PLC PROGRAM

To ensure that the configuration information contained in your PL-1746 is not accidentally erased, follow these steps to 'Read' configuration information from the PL1746. The Custom Data Monitor '(M0)STORE' can be thought of as an operational interface between the PL-1746 and your computer, All data files necessary for program operation are available through this CDM.

1. Ensure Key is in the 'PROG' state on your SLC CPU.
2. Set Bit S:2/3 to 'Yes' [otherwise an error will occur]
3. Download C01 & C04 Configuration.rss program into you SLC CPU.
4. Set B3/15 to '0' (READ)
5. Turn the SLC CPU keyswitch to 'RUN'.
6. Toggle B3/2 high (set to 1).

Once all of the configuration information has been downloaded from the SLC CPU, B3/2 will toggle back to '0'. To save this information, go to the upper left corner and click 'File', 'Save as'- give the configuration information a name that you choose. Now the configuration can be viewed in the Data Files N10-(M0-1), N11-(M0-2) and N13-(M0-3).



"Write" Configuration Information from PLC Program to PL-1746

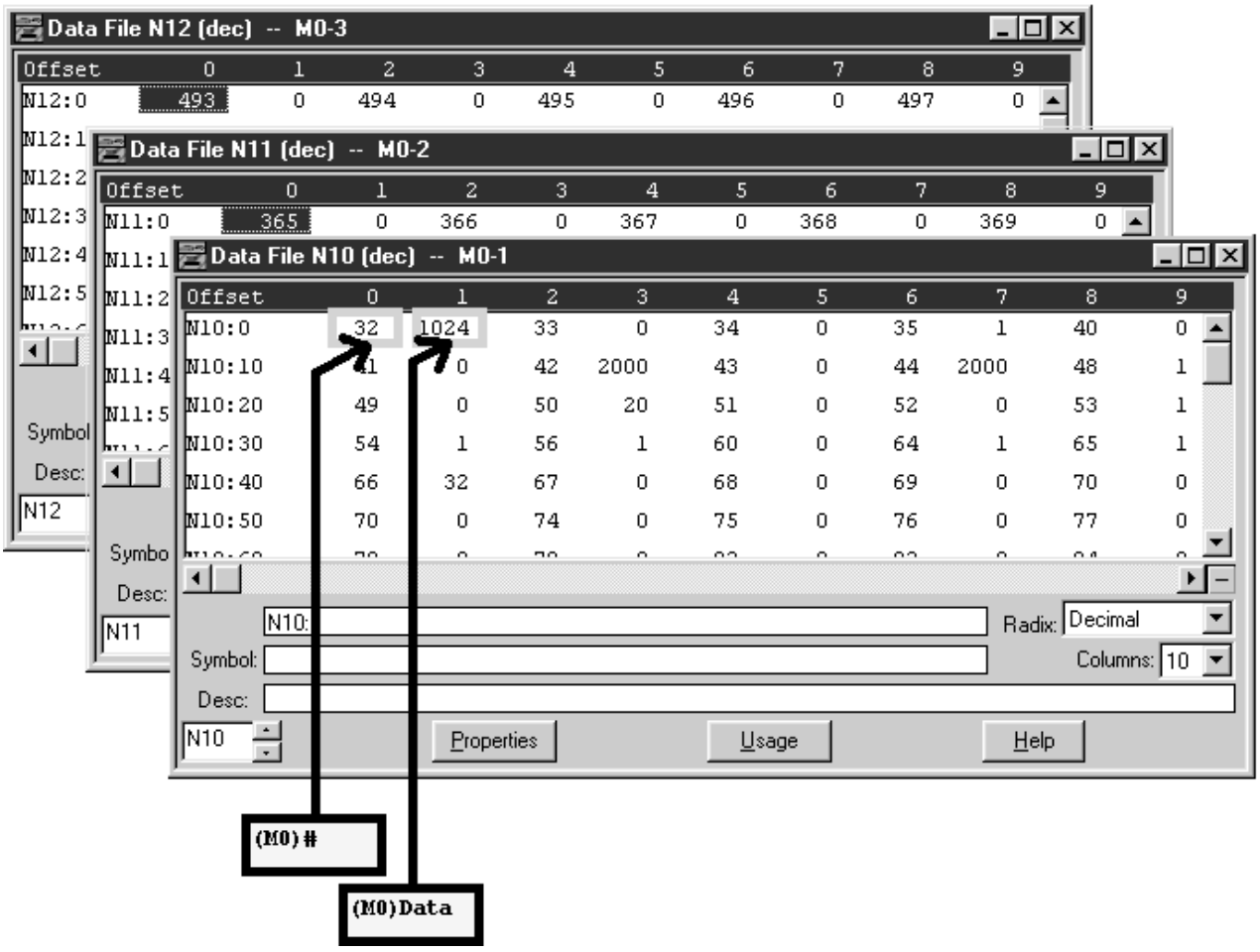
To "Write" configuration information from the PLC program to the PL-1746, perform the following steps:

1. Ensure keyswitch is in the 'PROG' state on your SLC CPU.
2. Download C01 & C04 Configuration.rss PLC program into your SLC CPU.
3. Set B3/15 to '1' (WRITE).
4. Turn the SLC CPU keyswtich to 'RUN'.
5. Toggle B3/2 high (set to 1).

Once this has been accomplished, all configuration information stored in the Data Files N10-(M0-1), N11-(M0-2) and N12-(M0-3) will be transferred from the PLC program to the configuration memory in the PL-1746.

Zero All Configuration Data

If you would like to zero all configuration information that is stored in the controller, you must go to the Data Files, enter all zeroes into the configuration values leaving the M0 # alone, then write these values back into the controller. Refer to the Data File shown above. In order to write a zero to that M0 register, the M0 Number must remain in the Data File, only the 'Data' must be set to zero.



C01 & C04 Pulses.rss: Setpoint Reading, Restoration, and Storage Program

Included with these instructions you will need the RS Logix PLC program C01 & C04 Pulses.rss. This program provides a way to read setpoints from the PL-1746 as well as a setpoint storage medium, to use the same setpoints for more than one controller. This program is intended for use with RS Logix 500 software, PL-1746 PLµS Plug-In Module, and SLC CPU 5/03 or higher. No input or output cards are necessary for this program to run properly, the only requirement is that the SLC CPU is in Slot 0 and the PL-1746 is in Slot 1.

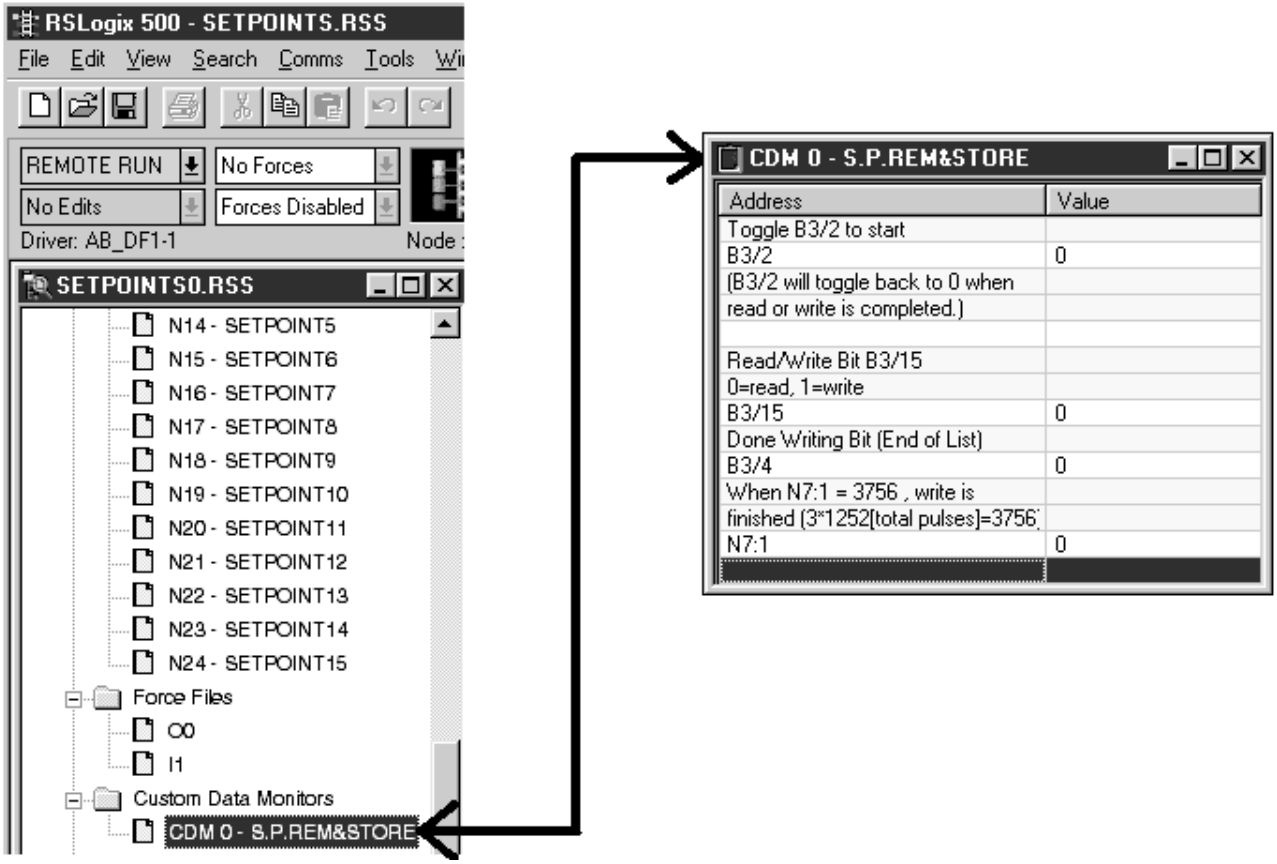
Prior to downloading and running the program, it must be configured for your setup the same way as described in the C01 & C04 Example.rss PLC program initialization. Once the program has been configured and downloaded, use these instructions to assist in setpoint reading and storage. The CDM shown below is the operational interface for setpoint reading and restoration.

"Read" setpoints from PL-1746 to PLC PROGRAM

To ensure that the setpoints contained in your PL-1746 are not accidentally erased when making backups, follow these steps to 'Read' setpoint information from the PL1746:

1. Ensure Key is in the 'PROG' state on your SLC CPU.
2. Download C01 & C04 Pulses.rss program into your SLC CPU.
3. Set B3/15 to '0' (READ)
4. Turn the SLC CPU keyswitch to 'RUN'.
5. Toggle B3/2 high (set to 1).

Once all setpoints have been downloaded from the SLC CPU, B3/2 will toggle back to '0'. To save these setpoints, go to the upper left corner and click 'File', 'Save as'- give the setpoints a name. Now the setpoints can be viewed in the Data Files N10 through N25. Each setpoint takes up three integer words, 'channel', 'on' value and 'off' value. The data tables are large enough to hold up to 1252 total setpoints. The more setpoints you have in the PL-1746, the more time it will take to either read or write setpoints.



C01 & C04 Pulses.rss: Setpoint Reading, Restoration, and Storage Program

“Write” Setpoints from PLC Program to PL-1746

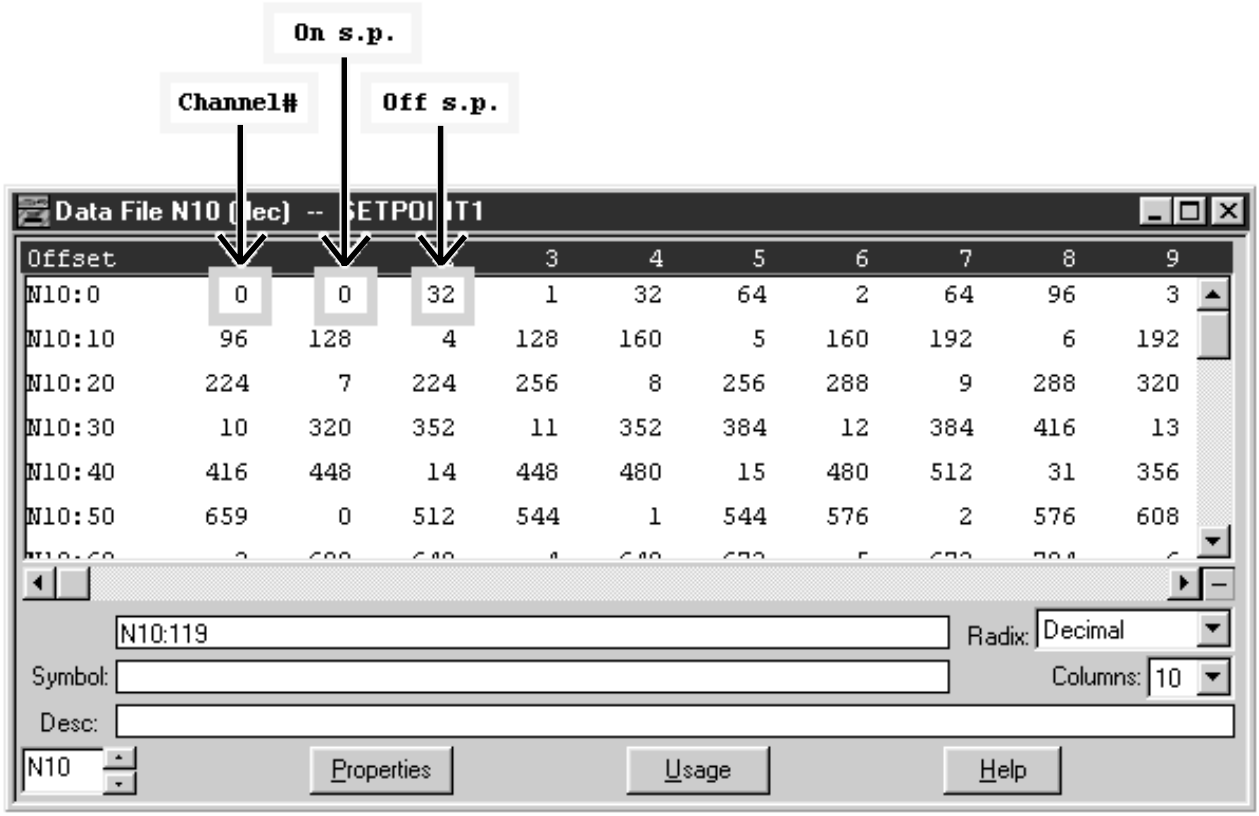
To ‘Write’ setpoints from the PLC program to the PL-1746, perform the following steps:

1. Ensure keyswitch is in the ‘PROG’ state on your SLC CPU.
2. Download C01 & C04 Pulses.rss PLC program into your SLC CPU.
3. Set B3/15 to ‘1’ (WRITE).
4. Turn the SLC CPU keyswitch to ‘RUN’.
5. Toggle B3/2 high (set to 1).

Once this has been accomplished, all setpoint information stored in the Data Files N10-SETPOINT1 through N24-SETPOINT15 will be transferred from the PLC program to the setpoint memory in the PL-1746.

Zero All Setpoints

If you would like to zero all setpoints that are in the controller, you must go to the Data Files, enter all zeroes into the Setpoint ‘ON’ and ‘OFF ’ values, then write these values back into the controller. Refer to the Data File shown above. In order to write a zero to that setpoint, the Channel Number must remain in the Data File. Only the ‘ON’ setpoint and the ‘OFF’ setpoint must be set to zero.



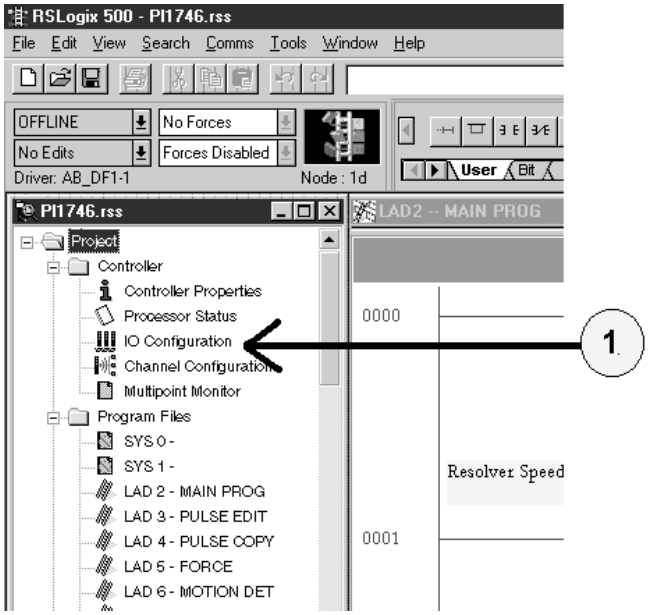
C01 & C04 Example.rss

Initial Programming steps are covered in the PL-1746 PLµS Plug-In Module manual. The main topics discussed in this supplement will be specific programming examples through RS Logix 500 programming software. This section was written for persons with some PLC Ladder programming experience. These supplemental programming examples will assist in the implementation of the PL-1746 into your operating enviroment.

To be used in conjunction with this document is the RS Logix program C01 & C04 Example.rss. It is recommended that you copy this program onto your hard drive for a 'working copy' of the program, and leave the copy on the disk in its original state. *To obtain copies of these RS-Logix programs, please contact Electro Cam Corp.by phone or email. 1-800-228-5487 or ecam@electrocam.com.*

Initialization of Program

In order for this program to be of use to you, you must re-configure it for your setup. In the example provided, we will start from scratch with a 4-slot rack with a 5/04 CPU already running RS Linx and RS Logix. Once the C01 & C04 Example.rss program has been selected and is running from within the RS Logix Program, double click on the item 'IO Configuration' as shown in Figure 1.



Once you have double-clicked on IO Configuration, the window I/O Configuration will appear, as shown below in Figure 2. Click once on the Read I/O Config button.

Figure 1

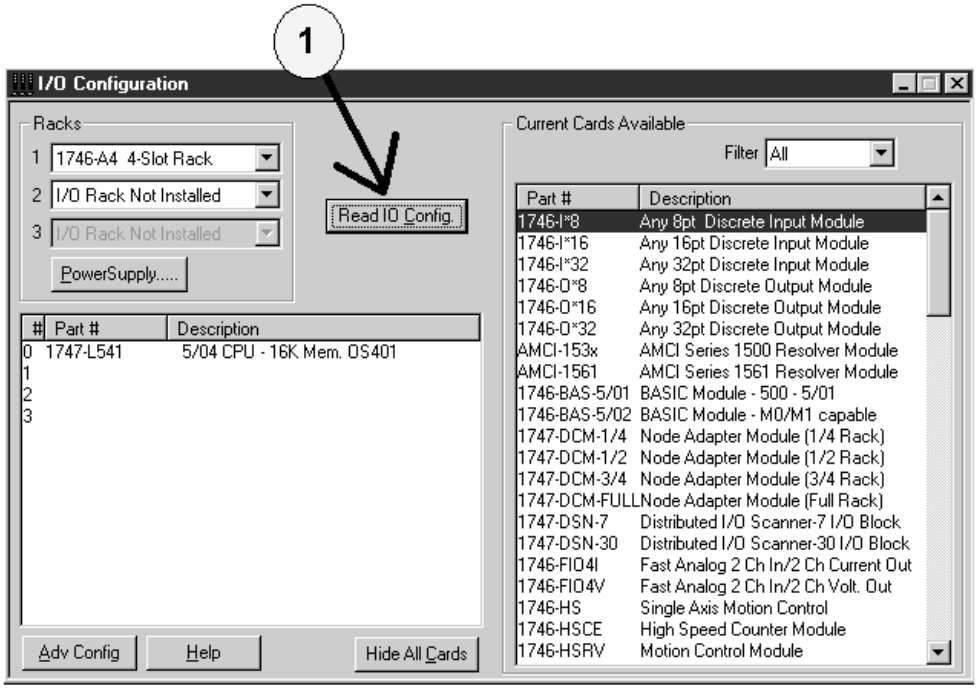


Figure 2

Once the 'I/O Configuration' has been pushed, the window shown in figure 3 will open. In order to read what the I/O Configuration is in your unit, the 'Read IO Config' button shown in Figure 3 must be clicked once.

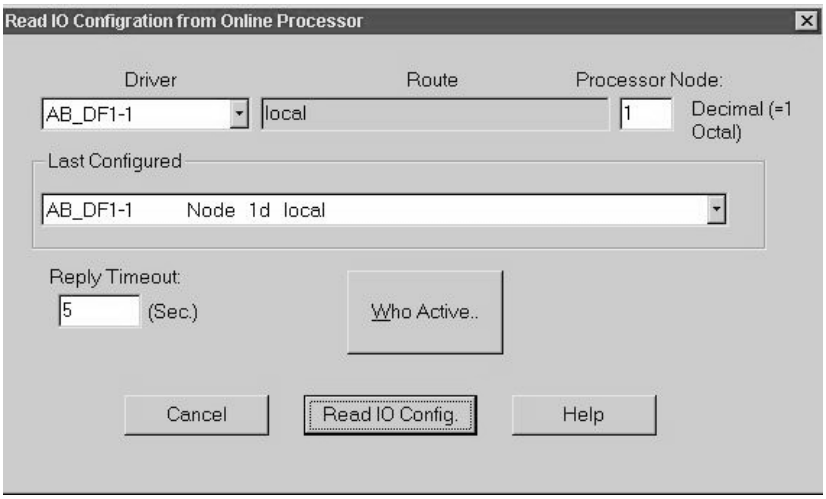


Figure 3

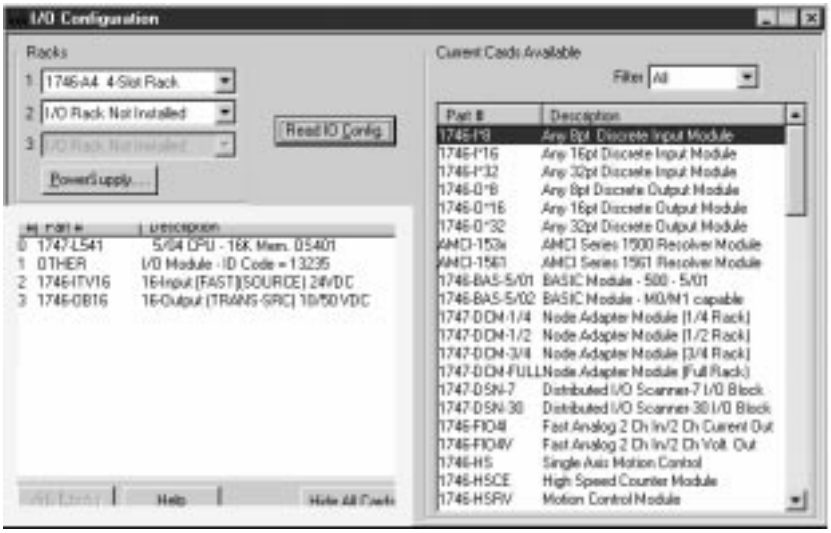


Figure 4

Once the I/O Configuration of your rack is read, the cards which are installed in the rack you are working with will be listed as in the highlighted box shown in figure 4. In this example, slot 1 contains the PL-1746, slot 2 contains an A-B 16 input card, and slot 3 contains an A-B 16 output card. As you may already know, the SLC CPU must reside in Slot 0. Depending on the type of CPU, input/output and A-B rack size, your setup might not look the same. Yours will probably be different than the example shown above. The only requirement for the PL-1746 to operate is that your CPU is 5/03 or higher. Neither input nor output cards are necessary for this program to run in your system. The only exception to this is if you would like to have the output channels from the PL-1746 present in one of your output channels. If no output module is present in your rack, then Rung 0000 will need to be deleted in order for this program to run prorperly. Click on rung 0000 once, then push the delete button.

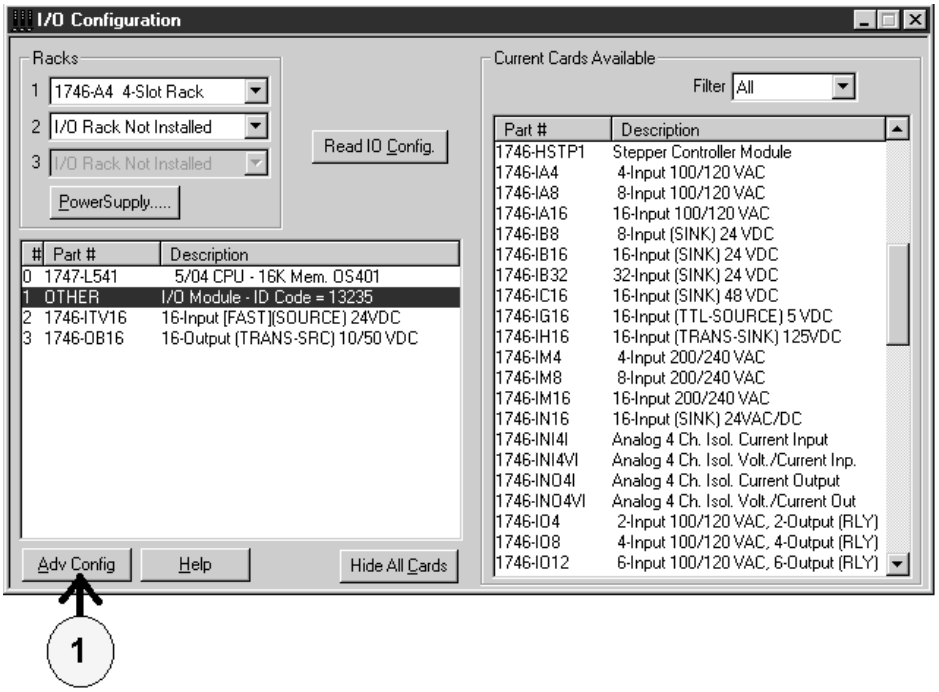


Figure 5

The final step in the initial programming of the PL-1746 is the M0 and M1 file length entry. The first step is to highlight the PL-1746 module Part # OTHER, Description-I/O Module-ID Code 13235. The next step is to click the 'Adv Config' button once, as shown in Figure 5.

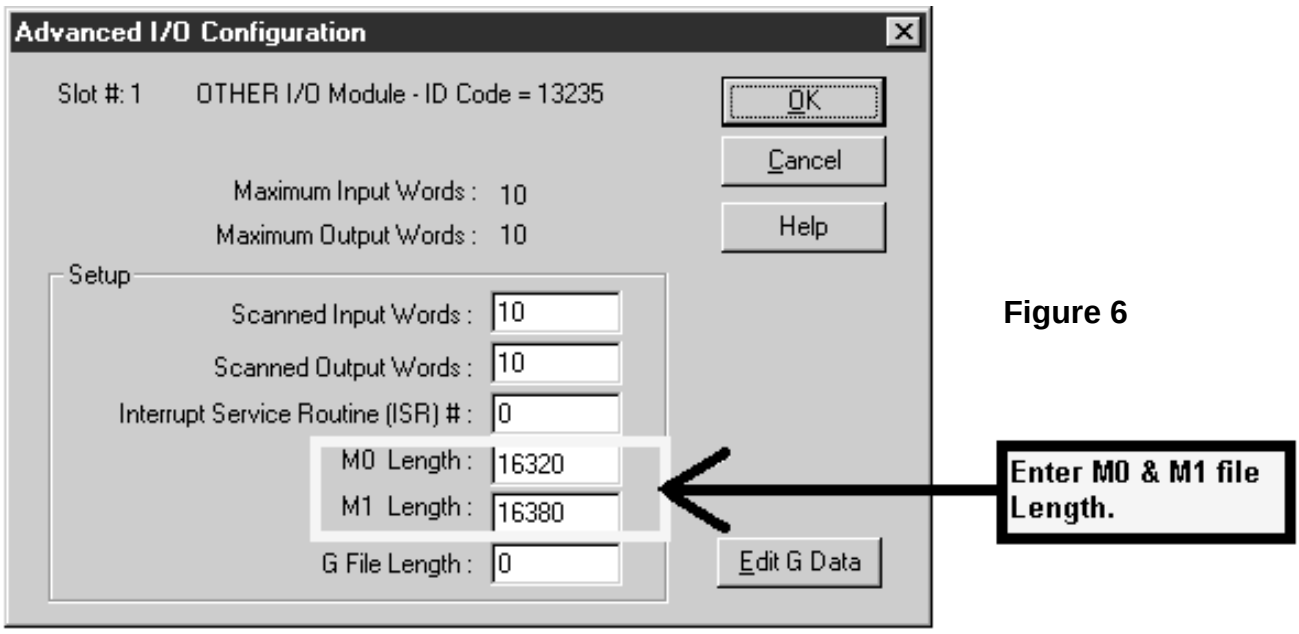


Figure 6

Once the 'Adv Config' button is clicked, the window shown in Figure 6 appears. Enter the M0 and M1 file length, as shown in Figure 6, then press 'OK'. Once this is done, the program is ready to be downloaded to the SLC CPU. Please keep in mind that if your setup has any specialty modules installed in your rack other than the PL-1746 and A-B Input or Output modules, these may require additional setup time.

Downloading the PLC Program to the SLC CPU

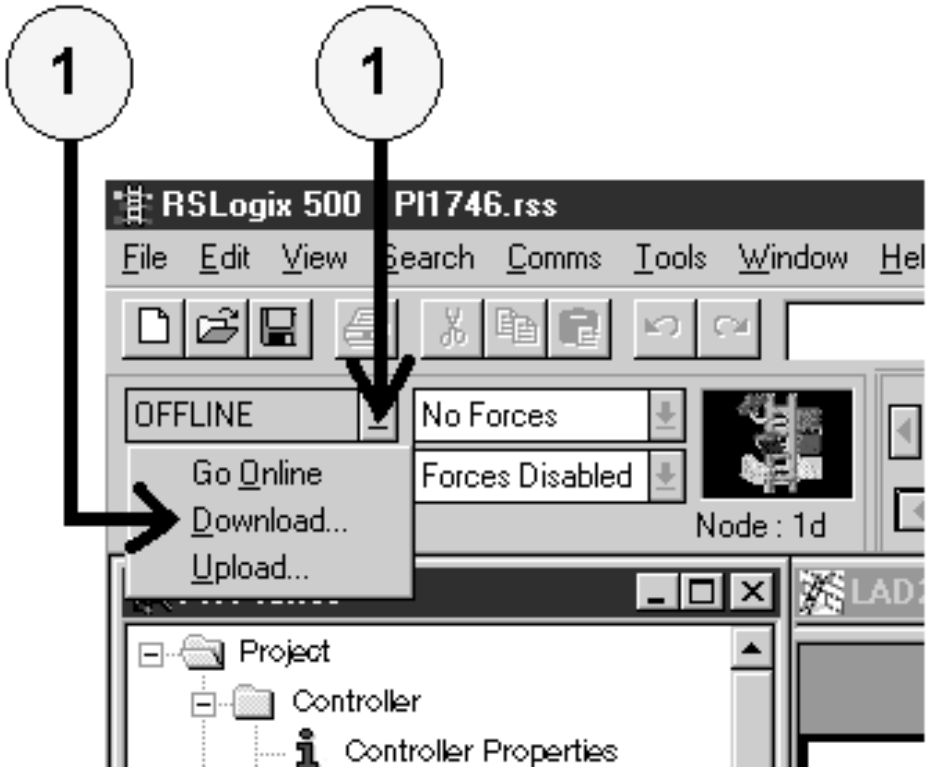


Figure 7

Before you begin downloading, it is best if you already have communications running through RS Linx to your PLC. Once the communications are up and running, you may proceed. There are two different ways to download a program from RS Logix, as shown in Figures 7 and 8. Either way will download the program the same way. In Figure 7, you click the down arrow once, then click the 'Download' item once. In Figure 8, you click on 'Comms' once, then 'Download' once.

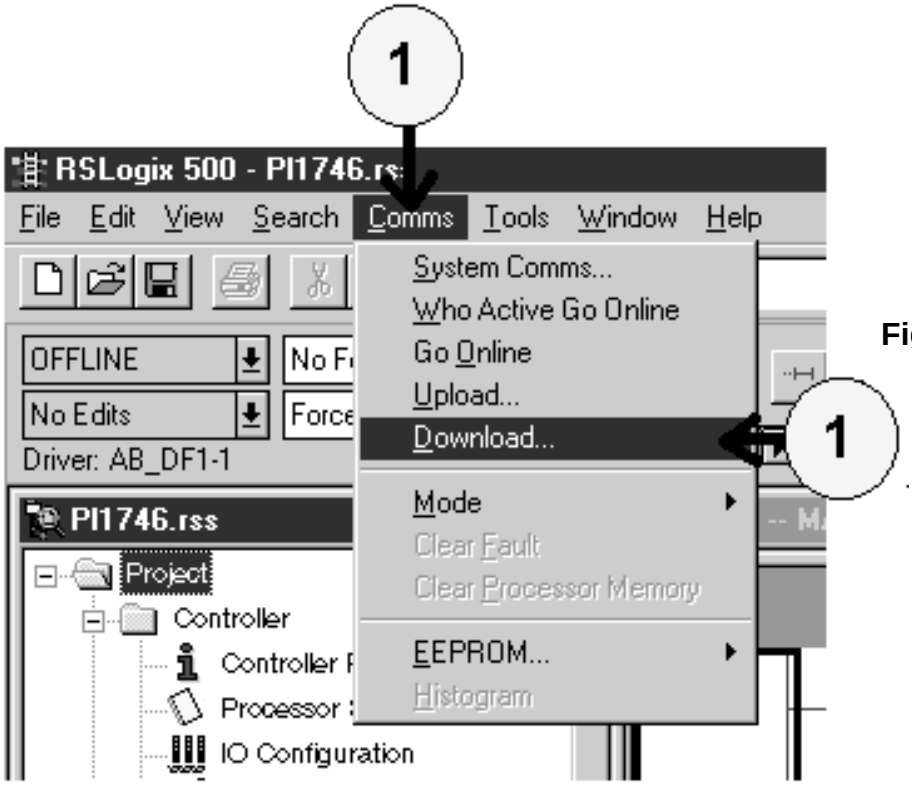


Figure 8

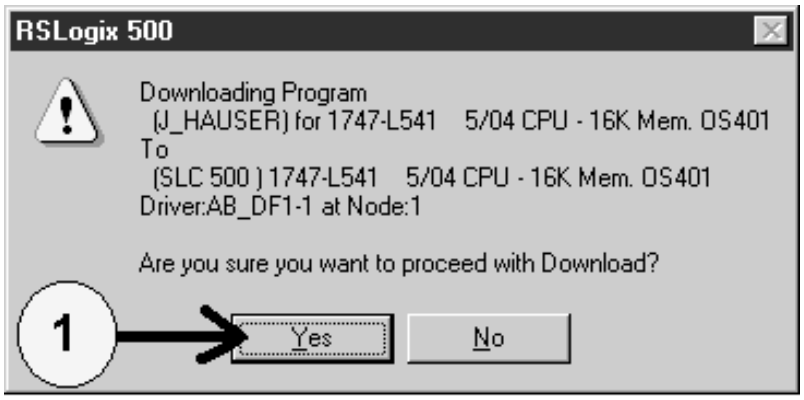


Figure 9

Figures 9 and 10 are the pop-up windows that will be viewed while downloading the program to the SLC CPU. Figure 9 confirms whether or not you would like to download the program you have specified. Remember that only one program can remain resident in the CPU at a time, so if you currently have a program in your PLC that may be needed again, be sure you can place it back into the memory of the PLC. Once the program has been downloaded, you have the choice of whether or not you would like to go online, simular to Figure 10. Select yes. Once online, you can monitor the status of the SLC CPU and the ladder program itself while it is running. From within the RS Logix program, if the selector switch on the SLC processor is in the REM position, you can select the operating condition (remote run, remote program) of the SLC CPU and the ladder program, as shown in Figure 11.

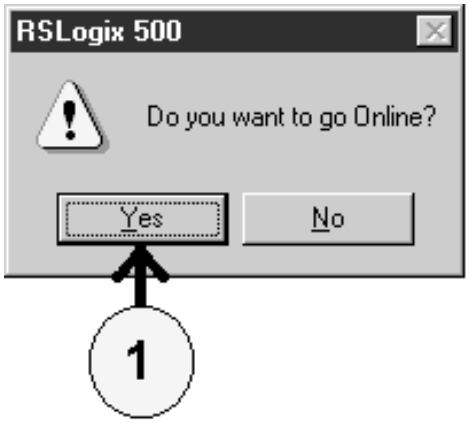


Figure 10

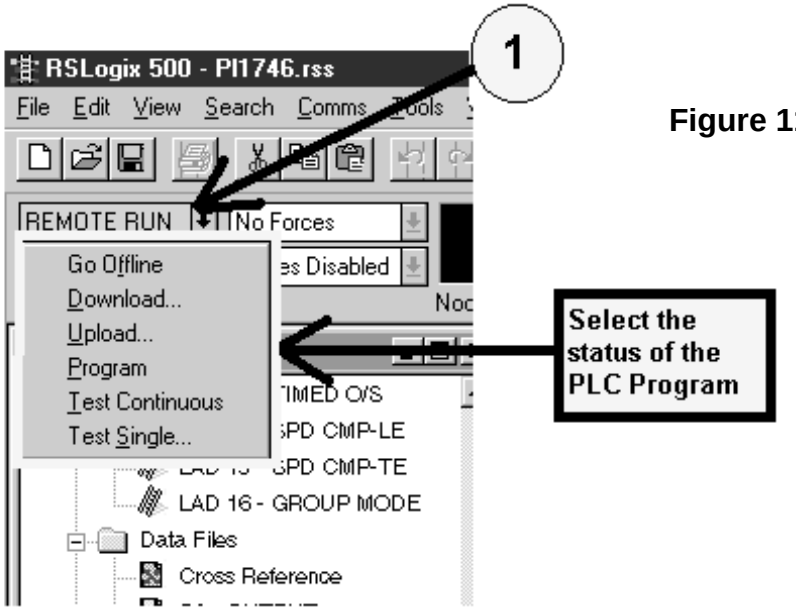


Figure 11

C01 & C04 Example.rss PLC Program Introduction

Now that the program is installed and running on your computer, and has been downloaded to the SLC CPU, we will begin using it to program PLS functions through the backplane. The examples included with this program show one way of programming the included functions, but by no means are the only way to program the various functions available through the backplane. These supplemental programming examples are meant to assist in the implementation of the PL-1746 into your operating enviroment.

'MAIN PROG'

The first ladder we will discuss is LAD 2-MAIN PROG. This ladder can be thought of as the 'control' ladder. All subroutine ladders 'jump' from this ladder, and upon completion of the tasks assigned to them, they 'return' to the MAIN PROG ladder to await furthur instructions.

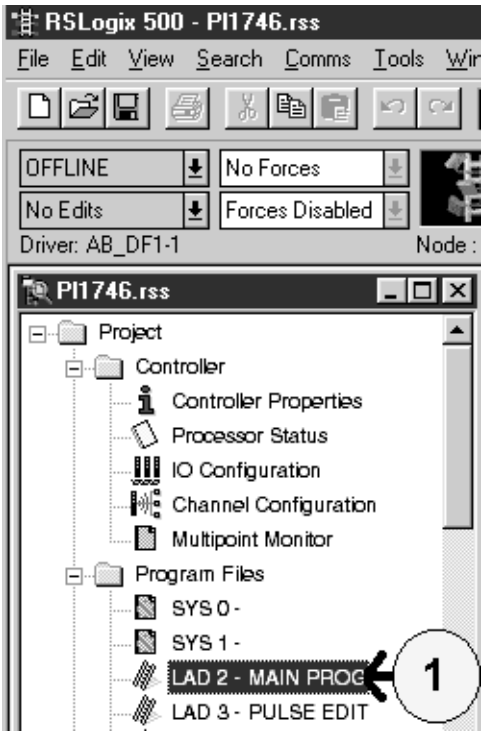


Figure 12

Figure 12 shows the location of the 'MAIN PROG' Ladder. To view this ladder, double click on 'MAIN PROG'. Once this has been done, you will see the active program 'MAIN PROG' as shown in Figure 13.

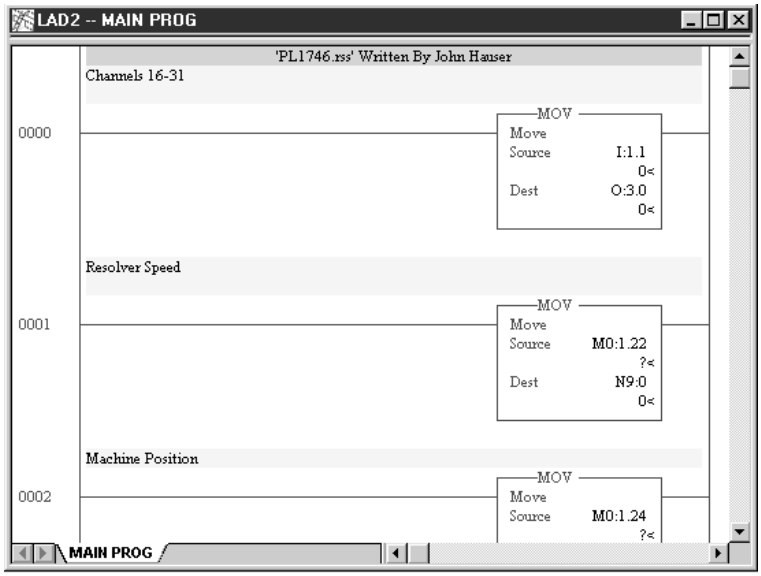


Figure 13

C01 & C04 Example.rss PLC Program Introduction (cont'd)

As discussed earlier, the subroutines contain the ladder programs used to perform the various PLS functions selected. To enter data into the program for use by the backplane, you can choose one of two methods. The first method is shown in figure 14, in which each individual data file associated with the specific program function is called up. The second method is shown in figure 14, where all data entry points required to perform the given task are organized into a Custom Data Monitor. Using the CDM for this makes this the task much less cumbersome than having to access each individual data file.

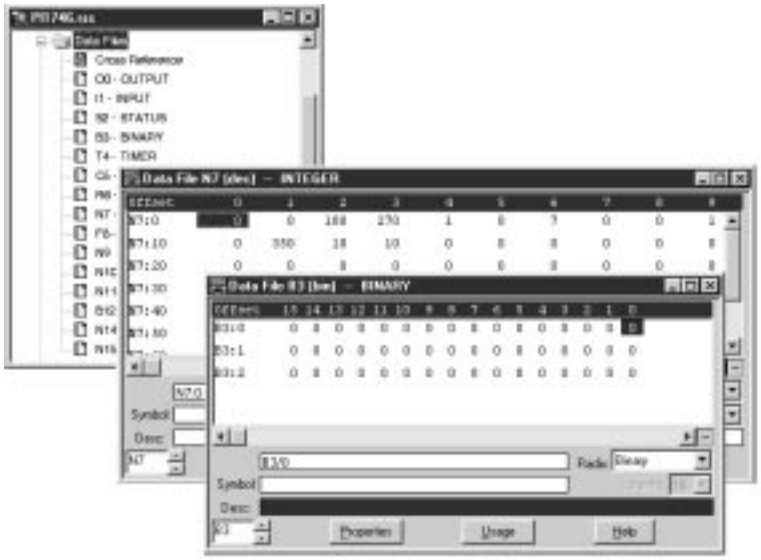


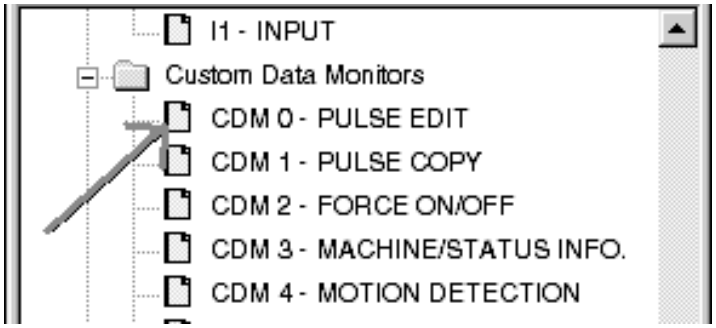
Figure 14

Entering the data by accessing each individual data file works fine, but using the CDM, as shown in figure 15, makes accessing data much easier. All data entry points can be centralized in one location, and each can be given a name of your choosing.

To access the Custom Data Monitor, double click on the icon for the particular CDM you want to open, as shown in figure 15a below.

Figure 15

Figure 15a



CDM 0 - PULSE EDIT

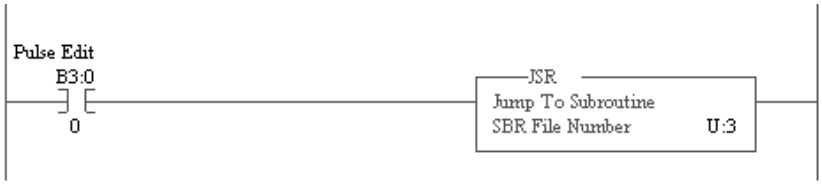
Address	Value
Toggle bit B3/0 to activate	
B3/0	0
Pulse Edit Program	
N7:0	0
Pulse Edit Channel	
N7:1	0
Pulse Edit On	
N7:2	180
Pulse Edit Off	
N7:3	270
Pulse Edit Pulse Number	
N7:4	1
Pulse Edit Pulses in Channel	
Total Number of Pulses	
(Read Only)	
N10:7	2
Pulse Edit Command/Status	
N7:6	7
1=read,3=write,5=IncOn,7=DecOn	
9=IncOff,11=DecOff,13=IncBoth,	
15=DecBoth.	

Pulse Edit

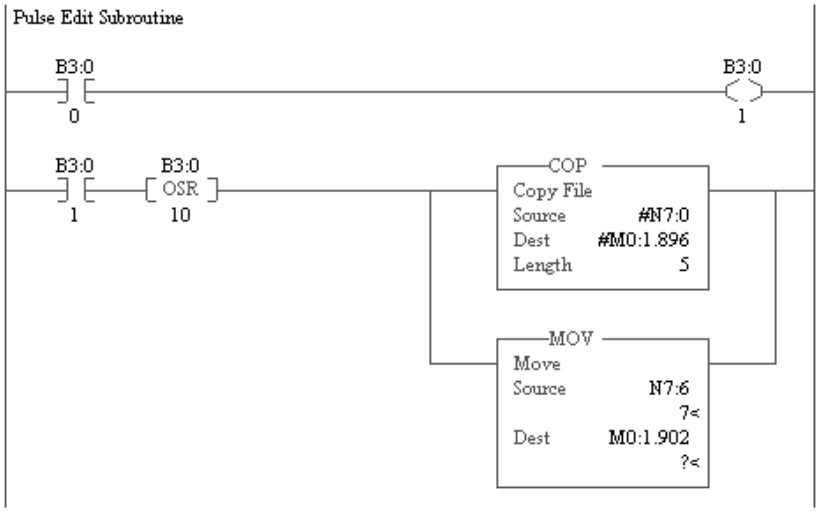
Next we will talk about the Pulse Edit functions available through the backplane of the SLC CPU to the PL-1746. The first thing that must be understood is the relationship between the Custom Data Monitor, the Main Program, and the Subroutines. The Custom Data Monitor (CDM) provides an interface between your computer and the SLC PLC program running in the SLC CPU. With the CDM, we can enter data into integer registers, binary registers, etc. We can also read from registers internal to the SLC CPU. With the Pulse Edit CDM we enter data into the integer registers, which can then be moved into the M0 registers in the SLC CPU. We also read from the M0 registers into the integer registers.

When we enter a '1' in B3/0 in the CDM, the program jumps to the subroutine. Once in the subroutine, B3/0 sets B3/1 to a high. B3/1 triggers (O)ne (S)hot (R)ising B3/10, which then copies N7:0, N7:1, N7:2, N7:3 and N7:4 to M0:1.896, M0:1.897, M0:1.898, M0:1.899 and M0:1.900. If you refer to the PL-1746 manual quick reference chart for M0 and M1 files, you can see what each M0 register is doing with the data that is being moved to it. Once the above tasks have been completed, all data is moved and/or copied to the appropriate 'N' register, 'B' registers are reset to zero, and the subroutine returns to the main program to await furthur instructions.

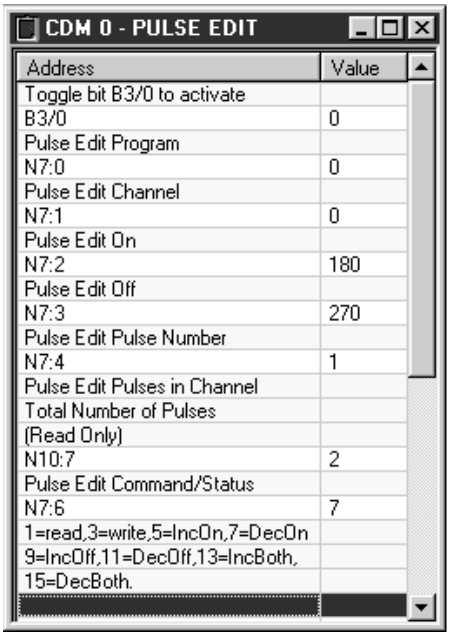
Main Program



Subroutine



Custom Data Monitor



The Pulse Edit functions can do a variety of different tasks for 'editing' pulses. We can read, write, increment the ON edge of a pulse, increment the OFF edge of a pulse, decrement the ON edge of a pulse, decrement the OFF edge of a pulse, increment both the ON and OFF edge of a pulse, or decrement both the ON and OFF edge of a pulse. We will now perform a few of the functions to familiarize you with how they can be used.

Read

To read the ON/OFF values from the CDM, we must do the following:

1. Enter the program in which we would like to edit a pulse from in N7:0.
2. Enter the channel where the pulse is located in N7:1.
3. If there is more than one pulse in this channel, we must write the pulse number that we would like to edit in N7:4. Until we know how many pulses are in that channel we can enter '0' (remember that in the 'Digital Universe', counting systems start at '0', so entering a '0' here will allow us to edit the first pulse in that channel.)
4. Enter '1' in N7:6.
5. Enter '1' in B3/0.

(continued)

Pulse Edit (cont'd)
Once the steps above have been completed, the pulses 'ON' value can be read from N7:2, and the 'OFF' value can be read from N7:3. After the first pulse has been read back, we can read the value located in N10:7, which will tell us how many pulses are in that channel. If there are multiple pulses in that channel, you can enter the pulse number you would like to read into N7:4, then enter a '1' in B3/0. That pulses ON and OFF values can be read from N7:2 and N7:3, respectively.

Write to a word/integer/bit
Note: Do not overlap pulses in one channel. If you overlap pulses in one channel, an internal error will be generated in the Module Status Register. If an error is generated, enter a '1' in O:1/8 'Clear Error Bit'.

To enter a pulses' on/off values from the CDM, do the following:
1. Enter the program in which we would like to write the pulse to in N7:0
2. Enter the channel which we would like the pulse to be written to in N7:1.
3. Enter the pulse's 'ON' value in N7:2.
4. Enter the pulse's 'OFF' value in N7:3.
5. Enter '3' in N7:6
6. Enter '1' in B3/0.

Once the above steps have been completed, we can read the pulses' on/off value as explained in example 1.

Increment On
To increment the on edge of a pulse from the CDM, we do the following:
1. Enter the program in N7:0
2. Enter the channel number in N7:1.
3. Enter the pulse number which you would like to increment in N7:4.
4. Enter '5' in N7:6.
5. Enter '1' in B3/0.

Notice that each time you 'toggle' B3/0 to one, you increment the ON edge of that pulse by one increment.

Decrement On
To decrement the ON edge of a pulse from the CDM we do the following:

1. Enter the program in N7:0.
2. Enter the Channel in N7:1.
3. Enter the pulse number in N7:4 if there are multiple pulses in the channel.
4. Enter '7' in N7:6.
5. Enter '1' in B3/0.

Notice that each time you 'toggle' B3/0, the pulses on edge is decremented by 1.

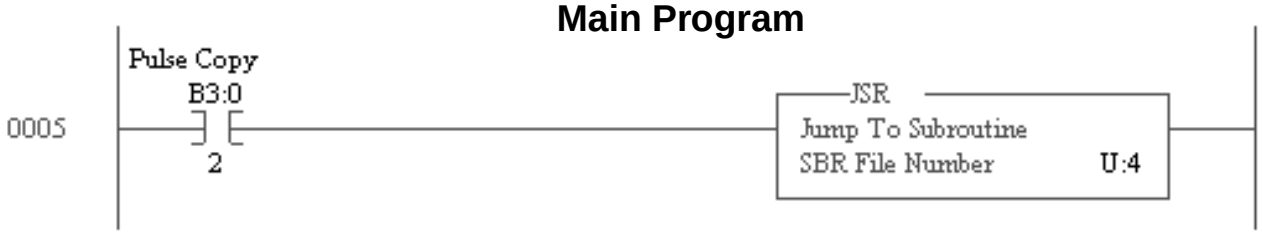
The remaining pulse edit functions available are Increment OFF edge, Decrement OFF edge, Increment both the ON and OFF edge, and Decrement both the ON and OFF edge. These functions are all performed in the same fashion as functions 3 and 4, except you change the value that is written into N7:6. The values entered for each function are as follows:

1 = Read.
3 = Write.
5 = Increment ON Edge.
7 = Decrement ON Edge.
9 = Increment OFF Edge.
11 = Decrement OFF Edge.
13 = Increment both the ON and OFF Edge.
15 = Decrement both the ON and OFF Edge.

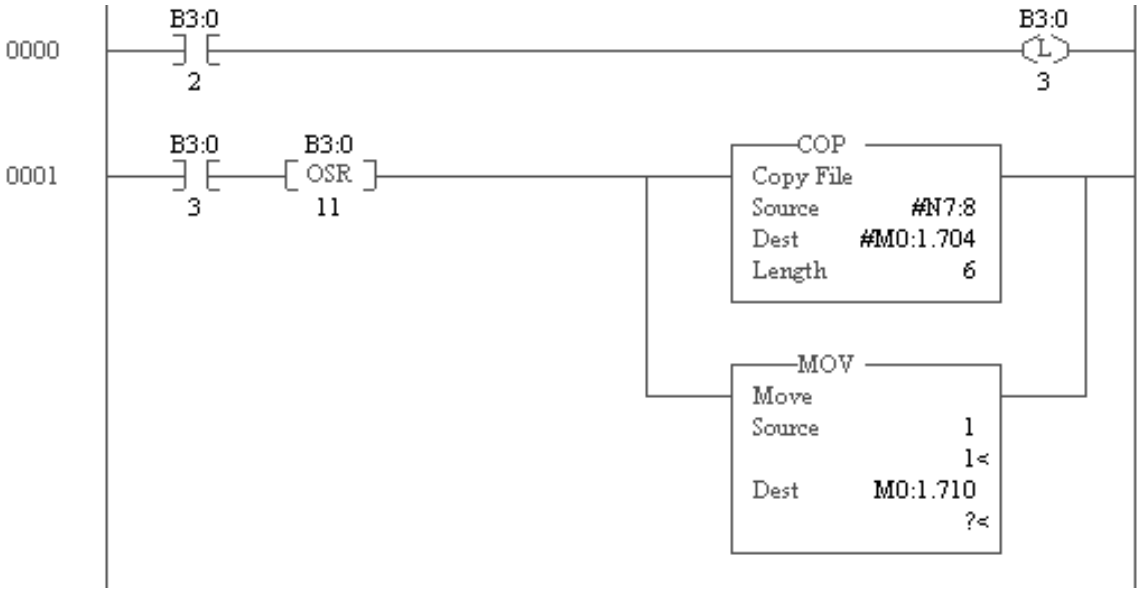
Pulse Copy

With the Pulse Copy function we can program a series or a 'train' of pulses into a specific channel without having to enter the ON and OFF setpoints for each pulse we would like to program. Pulse Copy uses the main program, subroutine, and CDM in the same manner as the Pulse Edit function.

Main Program



Subroutine



To perform a Pulse Copy:

1. Enter the program number in N7:8.
2. Enter the channel number in N7:9.
3. Enter the 'copy on' point in N7:10.
4. Enter the 'copy off' point in N7:11.
5. Enter the 'pulse count'(how many pulses you would like the 'train to consist of), in N7:12.
6. Enter the 'pulse duration'(how long you would like each pulse in that train to be), in N7:13.
7. Enter a '1' to B3/2 to activate Pulse Copy.

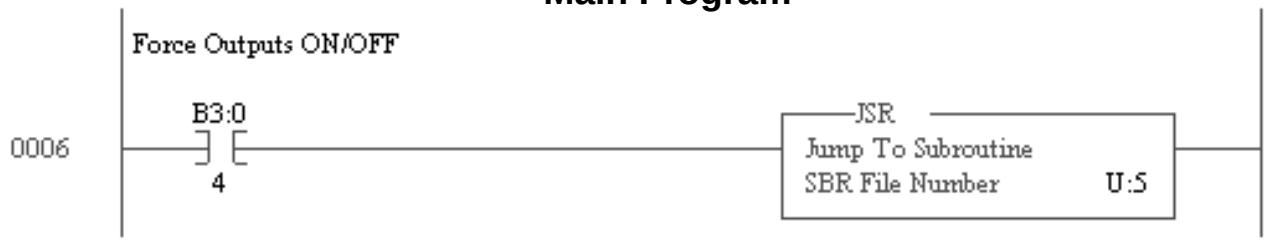
While the Pulse Copy is active, B3/2 will remain '1'. Once B3/2 goes to '0', Pulse Copy is complete. Ensure that pulses do not overlap, otherwise an error bit will be generated in the Module Status Register. If an error occurs, 'toggle' the 'CLEAR ERROR BIT', O:1/8. The values contained in the CDM shown to the right will copy a total of 10 pulses in Program 0, Channel 1. The pulse 'train' will start at 0 and end at 350. Each pulse will have a duration of 10 degrees.

Force Outputs On/Off

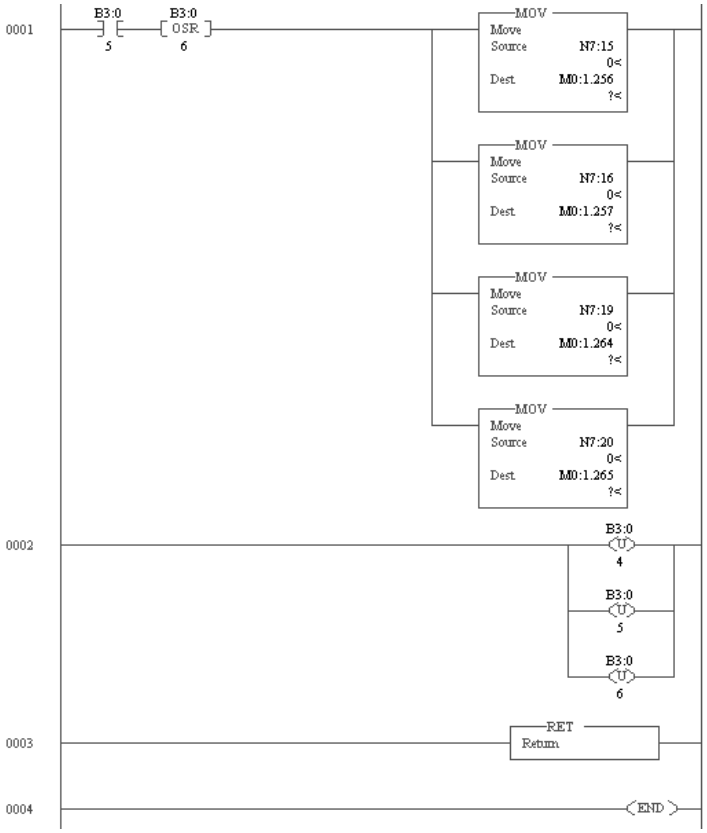
By performing the move command shown in the subroutine, we can force the outputs either 'ON' or 'OFF'. A force 'OFF' takes precedence over a force 'ON'. By toggling B3/4, we move N7:15, N7:16, N7:19 and N7:20 to M0:1.256, M0:1.257, M0:1.264 and M0:1.265. By writing a '1' to the bit locations in the 'N' registers N7:15 or N7:16, we force those outputs 'ON'. By writing a '1' to the bit locations in the 'N' registers N7:19 or N7:20, we force those outputs 'OFF'.

N7:15 and N7:19
Channels 0-15
15<----------0
0000 0000 0000 0000
N7:16 and N7:20
Channels 16-31
31<----------0
0000 0000 0000 0000

Main Program



Subroutine



CDM 2 - FORCE ON/OFF

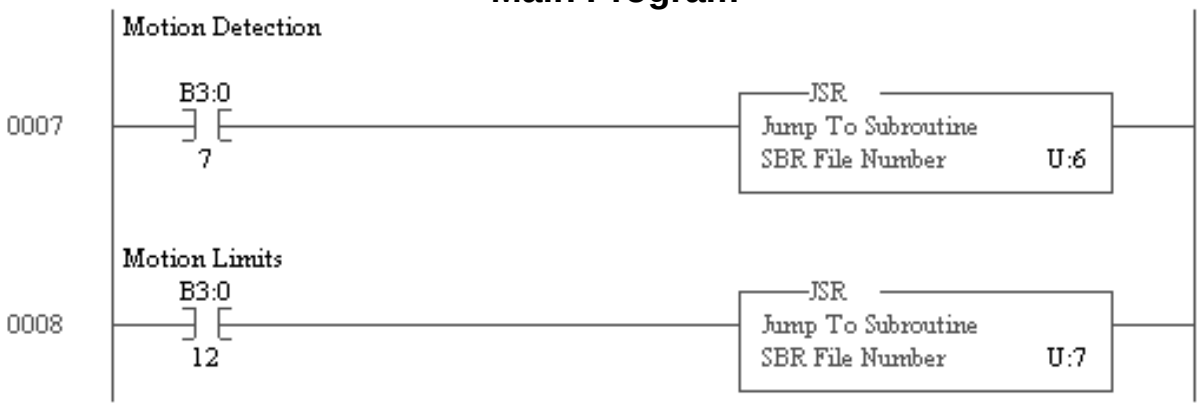
Address	Value
Use B3/4 to activate	
B3/4	0
Force Outputs ON 0 (15 <---0)	
N7:15	0000 0000 0000 0000
Force Outputs ON 1 (31<---16)	
N7:16	0000 0000 0000 0000
FORCE OUTPUTS OFF	
Use B3/4 to activate	
B3/4	0
Force Outputs OFF 0 (15 <---0)	
N7:19	0000 0000 0000 0000
Force Outputs OFF 1 (31<---16)	
N7:20	0000 0000 0000 0000
MODULE STATUS REGISTER	
I:1.7	0000 0000 0000 0000
O:1/8	0

Motion Detection and Motion Limits

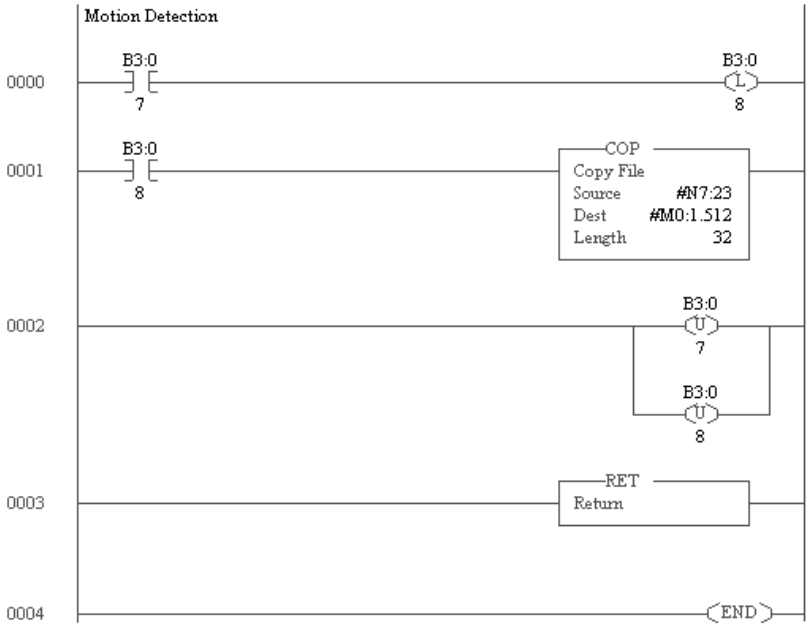
Motion Detection and Motion Limits work together. Motion Detection determines which motion limit each channel will be Anded to (0= no motion limit, 1= Limit 1, 2= Limit 2.) Motion Limits sets what the actual limit will be for Motion Limit 1 and Motion Limit 2. (Low Limit 1--High Limit 1, Low Limit 2--High Limit 2.).

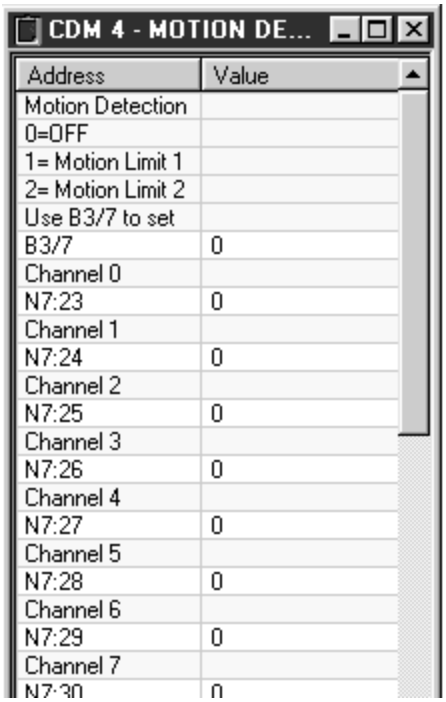
The Custom Data Monitor for both function the same as previous examples. In the Motion Detection CDM, each output channel has an integer register assigned to it. By writing a 0, 1, or 2 you declare if it will be Anded to a limit and which one. In the Motion Limits CDM, each limit has its own integer register in which you write the motion limit. (Low Limit 1=N7:55, High Limit 1=N7:56, Low Limit 2 = N7:57, High Limit 2 = N7:58).

Main Program



Subroutine (Motion Detection Limits)

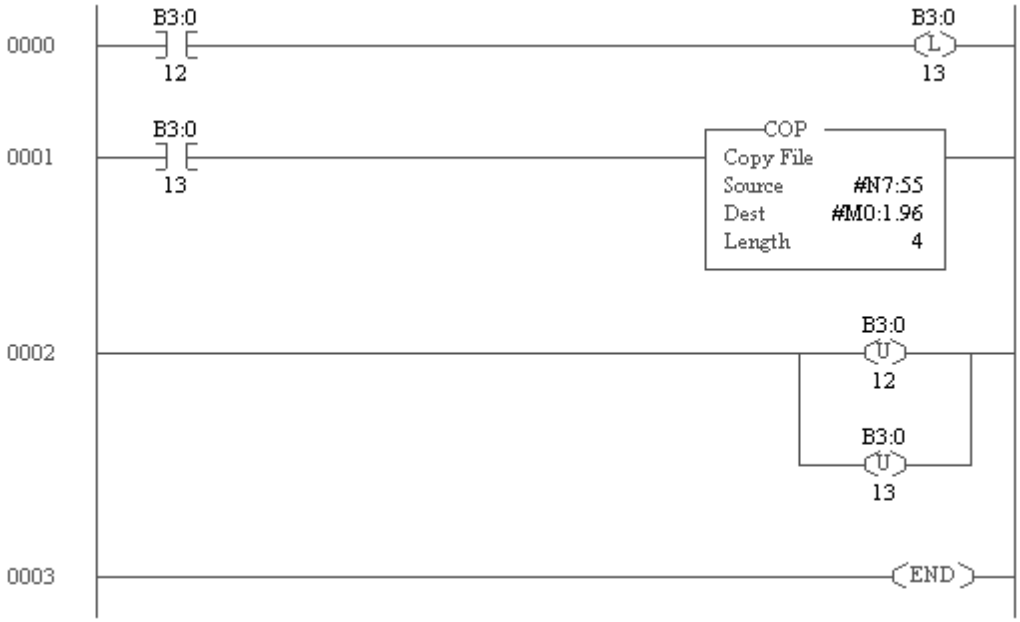




Motion Detection and Motion Limits (cont'd)

The remaining ladder diagrams and CDMs are self-explanatory. They are set up to test some of the functional operations of the PL-1746. If you have any specific questions in regards to how they function, please feel free to contact our Application Engineering or Customer Service Staff at 1-800-228-5487. You can also send your questions via FAX to 1-815-389-3304 or via email to ecam@electrocam.com.

Subroutine (Motion Limits)



CDM 5 - MOTION LIMITS

Address	Value
B3/12	0
Motion Level :1	
low limit	
Actual	
M0:1.96	?
New Value	
N7:55	200
Motion Level :1	
high limit	
Actual	
M0:1.97	?
New Value	
N7:56	950
Motion Level : 2	
low limit	
Actual	
M0:1.98	?
New Value	
N7:57	500
Motion Level : 2	
high limit	
Actual	
M0:1.99	?
New Value	
N7:58	850

C02 & C03 Configuration.rss

Purpose

This program provides a way to upload, preserve, and download PLS configuration data (all PLS data other than pulse data). Performing a read means uploading configuration data from the PLS and storing it in an N file. To preserve the configuration, save the .rss file in RS-Logix, including data files, after performing a read. Performing a write means downloading the configuration data from an N file into the PLS.

Read Instructions

1. Download the ladder program into the SLC processor.
2. Run the ladder program.
3. Open the Command/Status custom data monitor.
4. Clear the TransferDirection bit.
5. Set the Start bit. When all data has been transferred, the Done bit is set.

Write Instructions

1. Download the ladder program into the SLC processor.
2. Run the ladder program.
3. Open the Command/Status custom data monitor.
4. Set the TransferDirection bit.
5. Set the Start bit. When all data has been transferred, the Done bit is set.

Notes

1. If pulses are to be downloaded as well as configuration data, the pulses should be downloaded, as described in that program's instructions, after the configuration data has been downloaded as described above.
2. This program is intended for use with the C02 installed in slot 1 of the SLC rack. If that slot is unavailable, all references to slot 1 will have to be changed to the appropriate slot number.
3. Index Across Data Files (S:2/3) must be set to "Yes" for proper operation of this program.
4. See the documentation contained within the program for further details on its operation
5. See the chapter 3 of this manual for further details on errors.

Errors

Errors are indicated in the Command/Status Custom Data Monitor. If an error occurs, correct the problem, toggle the O:S.0/8 Clear Error bit (if necessary), and start the transfer again.

Bulk Error	This bit is set if an error occured during the bulk transfer, which includes all configura tion data other than the group configuration data.
Group Count Error	This bit is set if there was an out-of-range group count.
Group Position Display	This bit is set if there was an out-of-range group position display value.
Group Channel Count Error	This bit is set if there was an illegal group channel count condition.
Group Offset Error	This bit is set if there was an out-of-range group offset.
Group Mode Error	This bit is set if there was an out-of-range group mode.
Hardware Status/Error Register	This word indicates hardware status/errors in the C02.
Error Number Register	This word provides the Mapping Index Number of the register associated with the error indicated by the Module Status Register.
Programming Error Register	This word indicates programming errors.
Clear Error	This bit may be used to clear errors in either the Hardware Status Register or the Module Status Register.

C02 & C03 Pulses.rss

Purpose
This program provides a way to upload, preserve, and download PLS pulse data. Performing a read means uploading pulse data from the PLS and storing it in an N file. To preserve the pulse data, save the .rss file in RS-Logix, including data files, after performing a read. Performing a write means downloading the pulse data from an N file into the PLS.

Read Instructions
1. Download the ladder program into the SLC processor.
2. Run the ladder program.
3. Open the Command/Status custom data monitor.
4. Clear the TransferDirection bit.
5. Set the Start bit. When all data has been transferred, the Done bit is set.

Write Instructions
1. Download the ladder program into the SLC processor.
2. Run the ladder program.
3. Open the Command/Status custom data monitor.
4. Clear all pulse data from the C02/C03. (This is easily accomplished by using Memory Test Function 7002 if a PS-6400 keypad/display is available. If a keypad/display is not available, each channel must be cleared individually; see Pulse Edit for instructions.)
5. Set the TransferDirection bit.
6. Set the Start bit. When all data has been transferred, the Done bit is set.

Notes
1. If pulses are to be downloaded as well as configuration data, the pulses should be downloaded after the configuration data has been downloaded as described above.
2. This program is intended for use with the C02 installed in slot 1 of the SLC rack. If that slot is unavailable, all references to slot 1 will have to be changed to the appropriate slot number.
3. Index Across Data Files (S:2/3) must be set to “Yes” for proper operation of this program.
4. See the documentation contained within the program for further details on its operation
5. See the chapter 3 of this manual for further details on errors.

Errors
Errors are indicated in the Command/Status Custom Data Monitor. If an error occurs, correct the problem, toggle the O:S.0/8 Clear Error bit (if necessary), and start the transfer again.

Hardware Status/Error Register This word indicates hardware status/errors in the C02.

Error Number Register	This word provides the Mapping Index Number of the register associated with the error indicated by the Module Status Register.
Programming Error Register	This word indicates programming errors.
Clear Error	This bit may be used to clear errors in either the Hardware Status Register or the Module Status Register.

C02 & C03 Example.rss

This program provides examples of ladder programming for modifying PL-1746 configuration and pulse data while in run mode. These examples can be followed, for example, when making HMIs operate with the PL-1746.

C02 & C03 -S Configuration.rss

See instructions for the C02 & C03 Configuration.rss ladder program.

C02 & C03 -S Pulses.rss

See instructions for the C02 & C03 Pulses.rss ladder program.

C02 & C03 -S Example.rss

See instructions for the C02 & C03 Example.rss ladder program.