

Yasnac ERC and MRC Controller

***Floppy Disk Emulator
for Windows
Instruction Manual***

Part Number 131585-2

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NOTES

1.0 INTRODUCTION

The Floppy Disk Emulator (FDE) for Windows software package allows robot programs to be uploaded, downloaded, and deleted from an IBM-compatible computer via RS232 serial communications. The software package is compatible with the ERC and MRC controllers.

1.1 GENERAL DESCRIPTION

The FDE for Windows software package with 3.5" disks (Part Number 132825-1) includes the following items:

- FDE for Windows Software on 3.5" disks (Part Number 132826-1)
- 25-pin to 25-pin cable (Part Number 132389-1)
- 25-pin to 9-pin adapter (Part Number 132520-1)
- Hardware key (Part Number 132827-1)
- FDE for Windows Instruction Manual (Part Number 131585-2)

The FDE for Windows software package with 5-1/4" disks (Part Number 132825-2) includes the following items:

- FDE for Windows Software on 5-1/4" disks (Part Number 132826-2)
- 25-pin to 25-pin cable (Part Number 132389-1)
- 25-pin to 9-pin adapter (Part Number 132520-1)
- Hardware key (Part Number 132827-1)
- FDE for Windows Instruction Manual (Part Number 131585-2)

1.2 HOW TO USE THIS MANUAL

This manual contains instructions to use the FDE for Windows with either an ERC or MRC controller. Section 3 contains the installation and startup instructions for both ERC and MRC controllers. If you have an ERC controller, please see Section 4 for operating instructions. If you have an MRC controller, please see Section 5 for operating instructions. Section 6 contains troubleshooting information for both the ERC and MRC controllers.

Along with the appropriate sections, please be sure to read the remainder of Section 1 and Section 2 (Safety) in its entirety before continuing.

1.3 EQUIPMENT AND SUPPLIES REQUIRED

IBM PC/AT or compatible computer with:

- DOS V5.0 or above
- Windows 3.1 or above
- EGA or VGA video adapter
- at least one serial communications port, (COM1 through COM4 are supported)
- 512k free conventional memory
- 500k hard disk space available

1.4 FLOPPY DISK PRECAUTIONS

As with any magnetic recording media, the floppy disks are subject to damage and erasure from magnetic fields and other unusual conditions.

DO NOT:

- expose the disk to magnetic fields caused by permanent magnets, electrical currents, motors, transformers, and welding arcs.
- expose the floppy disks to high or low temperatures, moisture, static electric charges, dirt or dust, or X-rays.
- open the metal shutter or touch the disk inside the shutter.
- apply pressure to the disk enclosure or force disk into a floppy disk drive.

1.5 WRITE PROTECT WINDOW

Each floppy disk has a write protect window. This is the small opening on the lower left portion of the floppy disk. With the window closed, it is possible to write to the disk. With the window open, the disk drive will not overwrite the existing files. For most operations, ensure that the window is closed and locked.

2.0 SAFETY

It is the purchaser's responsibility to ensure that all local, county, state, and national codes, regulations, rules, or laws relating to safety and safe operating conditions for each installation are met and followed.

We suggest that you obtain and review a copy of the ANSI/RIA National Safety Standard for Industrial Robots and Robot Systems. This information can be obtained from the Robotic Industries Association by requesting ANSI/RIA R15.06. The address is as follows:

Robotic Industries Association

900 Victors Way

P.O. Box 3724

Ann Arbor, Michigan 48106

TEL: 313/994-6088

FAX: 313/994-3338

Ultimately, the best safeguard is trained personnel. The user is responsible for providing personnel who are adequately trained to operate, program, and maintain the robot cell. **The robot must not be operated by personnel who have not been trained!**

We recommend that all personnel who intend to operate, program, repair, or use the robot system be trained in an approved Motoman training course and become familiar with the proper operation of the system.

This safety section addresses the following:

- Standard Conventions (see Section 2.1)
- General Cautions and Warnings (see Section 2.2)
- Mechanical Safety Devices (see Section 2.3)
- Installation Safety (see Section 2.4)
- Programming Safety (see Section 2.5)
- Operation Safety (see Section 2.6)
- Maintenance Safety (see Section 2.7)

2.1 **STANDARD CONVENTIONS**

This manual includes information essential to the safety of personnel and equipment. As you read through this manual, be alert to the four signal words:

- DANGER
- WARNING
- CAUTION
- NOTE

Pay particular attention to the information provided under these headings which are defined below (in descending order of severity).



DANGER!

Information appearing under the DANGER caption concerns the protection of personnel from the immediate and imminent hazards that, if not avoided, will result in immediate, serious personal injury or loss of life in addition to equipment damage.



WARNING!

Information appearing under the WARNING caption concerns the protection of personnel and equipment from potential hazards that can result in personal injury or loss of life in addition to equipment damage.



CAUTION!

Information appearing under the CAUTION caption concerns the protection of personnel and equipment, software, and data from hazards that can result in minor personal injury or equipment damage.

NOTE: *Information appearing in a NOTE caption provides additional information which is helpful in understanding the item being explained.*

2.2 GENERAL SAFEGUARDING TIPS

All operators, programmers, plant and tooling engineers, maintenance personnel, supervisors, and anyone working near the robot must become familiar with the operation of this equipment. All personnel involved with the operation of the equipment must understand potential dangers of operation. General safeguarding tips are as follows:

- Improper operation can result in personal injury and/or damage the equipment. Only trained personnel familiar with the operation of this robot, the operator's manuals, the system equipment, and options and accessories should be permitted to operate this robot system.
- Do not enter the robot cell while it is in automatic operation. Programmers must have the teach pendant when they enter the robot cell.
- Improper connections can damage the robot. All connections must be made within the standard voltage and current ratings of the robot I/O (Inputs and Outputs).
- The robot must be placed in Emergency Stop (E-Stop) mode whenever it is not in use.
- In accordance with ANSI/RIA R15.06, section 6.13.4 and 6.13.5, use lockout/tagout procedures during equipment maintenance. Refer also to Section 1910.147 (29CFR, Part 1910), Occupational Safety and Health Standards for General Industry (OSHA).

2.3 MECHANICAL SAFETY DEVICES

The safe operation of the robot, positioner, auxiliary equipment, and system is ultimately the user's responsibility. The conditions under which the equipment will be operated safely should be reviewed by the user. The user must be aware of the various national codes, ANSI/RIA R15.06 safety standards, and other local codes that may pertain to the installation and use of industrial equipment. Additional safety measures for personnel and equipment may be required depending on system installation, operation, and/or location. The following safety measures are available:

- Safety fences and barriers
- Light curtains
- Door interlocks
- Safety mats
- Floor markings
- Warning lights

Check all safety equipment frequently for proper operation. Repair or replace any non-functioning safety equipment immediately.

2.4 **INSTALLATION SAFETY**

Safe installation is essential for protection of people and equipment. The following suggestions are intended to supplement, but not replace, existing federal, local, and state laws and regulations. Additional safety measures for personnel and equipment may be required depending on system installation, operation, and/or location. Installation tips are as follows:

- Be sure that only qualified personnel familiar with national codes, local codes, and ANSI/RIA R15.06 safety standards are permitted to install the equipment.
- Identify the work envelope of each robot with floor markings, signs, and barriers.
- Position all controllers outside the robot work envelope.
- Whenever possible, install safety fences to protect against unauthorized entry into the work envelope.
- Eliminate areas where personnel might get trapped between a moving robot and other equipment (pinch points).
- Provide sufficient room inside the workcell to permit safe teaching and maintenance procedures.

2.5 **PROGRAMMING SAFETY**

All operators, programmers, plant and tooling engineers, maintenance personnel, supervisors, and anyone working near the robot must become familiar with the operation of this equipment. All personnel involved with the operation of the equipment must understand potential dangers of operation. Programming tips are as follows:

- Any modifications to PART 1 of the MRC controller PLC can cause severe personal injury or death, as well as damage to the robot! Do not make any modifications to PART 1. Making any changes without the written permission of Motoman will **VOID YOUR WARRANTY!**
- Some operations require standard passwords and some require special passwords. Special passwords are for Motoman use only. **YOUR WARRANTY WILL BE VOID** if you use these special passwords.
- Back up all programs and jobs onto a floppy disk whenever program changes are made. To avoid loss of information, programs, or jobs, a backup must always be made before any service procedures are done and before any changes are made to options, accessories, or equipment.
- The concurrent I/O (Input and Output) function allows the customer to modify the internal ladder inputs and outputs for maximum robot performance. Great care must be taken when making these modifications. Double-check all modifications under every mode of robot operation to ensure that you have not created hazards or dangerous situations that may damage the robot or other parts of the system.
- Improper operation can cause personal injury and/or damage the equipment. Only trained personnel familiar with the operation, manuals, electrical design, and equipment interconnections of this robot should be permitted to operate the system.

- Inspect the robot and work envelope to be sure no potentially hazardous conditions exist. Be sure the area is clean and free of water, oil, debris, etc.
- Be sure that all safeguards are in place.
- Check the E-STOP button on the teach pendant for proper operation before programming.
- Carry the teach pendant with you when you enter the workcell.
- Be sure that only the person holding the teach pendant enters the workcell.
- Test any new or modified program at low speed for at least one full cycle.

2.6 OPERATION SAFETY

All operators, programmers, plant and tooling engineers, maintenance personnel, supervisors, and anyone working near the robot must become familiar with the operation of this equipment. All personnel involved with the operation of the equipment must understand potential dangers of operation. Operation tips are as follows:

- Be sure that only trained personnel familiar with the operation of this robot, the operator's manuals, the system equipment, and options and accessories are permitted to operate this robot system.
- Check all safety equipment for proper operation. Repair or replace any non-functioning safety equipment immediately.
- Inspect the robot and work envelope to ensure no potentially hazardous conditions exist. Be sure the area is clean and free of water, oil, debris, etc.
- Ensure that all safeguards are in place.
- Improper operation can cause personal injury and/or damage the equipment. Only trained personnel familiar with the operation, manuals, electrical design, and equipment interconnections of this robot should be permitted to operate the system.
- Do not enter the robot cell while it is in automatic operation. Programmers must have the teach pendant when they enter the cell.
- The robot must be placed in Emergency Stop (E-Stop) mode whenever it is not in use.
- This equipment has multiple sources of electrical supply. Electrical interconnections are made between the controller, external servo box, and other equipment. Disconnect and lockout/tagout all electrical circuits before making any modifications or connections.
- All modifications made to the controller will change the way the robot operates and can cause severe personal injury or death, as well as damage the robot. This includes controller parameters, ladder parts 1 and 2, and I/O (Input and Output) modifications. Check and test all changes at slow speed.

2.7 MAINTENANCE SAFETY

All operators, programmers, plant and tooling engineers, maintenance personnel, supervisors, and anyone working near the robot must become familiar with the operation of this equipment. All personnel involved with the operation of the equipment must understand potential dangers of operation. Maintenance tips are as follows:

- Do not perform any maintenance procedures before reading and understanding the proper procedures in the appropriate manual.
- Check all safety equipment for proper operation. Repair or replace any non-functioning safety equipment immediately.
- Improper operation can cause personal injury and/or damage the equipment. Only trained personnel familiar with the operation, manuals, electrical design, and equipment interconnections of this robot should be permitted to operate the system.
- Back up all your programs and jobs onto a floppy disk whenever program changes are made. A backup must always be made before any servicing or changes are made to options, accessories, or equipment to avoid loss of information, programs, or jobs.
- Do not enter the robot cell while it is in automatic operation. Programmers must have the teach pendant when they enter the cell.
- The robot must be placed in Emergency Stop (E-Stop) mode whenever it is not in use.
- Be sure all safeguards are in place.
- Use proper replacement parts.
- This equipment has multiple sources of electrical supply. Electrical interconnections are made between the controller, external servo box, and other equipment. Disconnect and lockout/tagout all electrical circuits before making any modifications or connections.
- All modifications made to the controller will change the way the robot operates and can cause severe personal injury or death, as well as damage the robot. This includes controller parameters, ladder parts 1 and 2, and I/O (Input and Output) modifications. Check and test all changes at slow speed.
- Improper connections can damage the robot. All connections must be made within the standard voltage and current ratings of the robot I/O (Inputs and Outputs).

3.0 INSTALLING THE PROGRAM

This section contains instructions for installation, startup, and operation of the FDE for Windows Package (Part Number 132825-1 or 132825-2) with either an ERC or an MRC controller.

3.1 COMMUNICATION CABLE

The communication cable (Motoman Part Number 132389-1) is a 25-pin to 25-pin cable. The pin-outs for the 25-pin to 25-pin cable are shown in Figure 3-1. To connect the computer to the robot controller:

1. Connect the 25-pin male end of the serial communication cable (Part Number 132389-1) to the controller RS-232C serial port located on the subpanel of the robot playback box.
2. Connect the other end of the cable to the serial port on the computer. Use the 9-pin adapter (Part Number 132520-1) if necessary.
3. Attach the hardware key to the parallel port LPT1 on the computer.

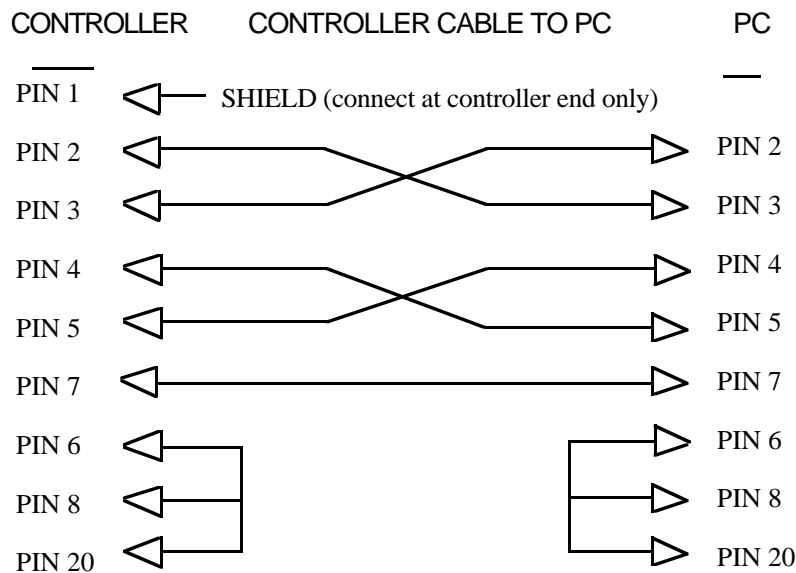


Figure 3-1 RS-232C Serial Cable Connections Between the Controller and PC

3.2 **INSTALLATION AND STARTUP**

To install, configure, and start the FDE for Windows software:

1. Start Windows.
2. Insert the FDE for Windows software installation diskette into a floppy disk drive.
3. From the Windows Program Manager, select "Run."
4. Type A:\SETUP.EXE or B:\SETUP.EXE at the command line. See Figure 3-2.

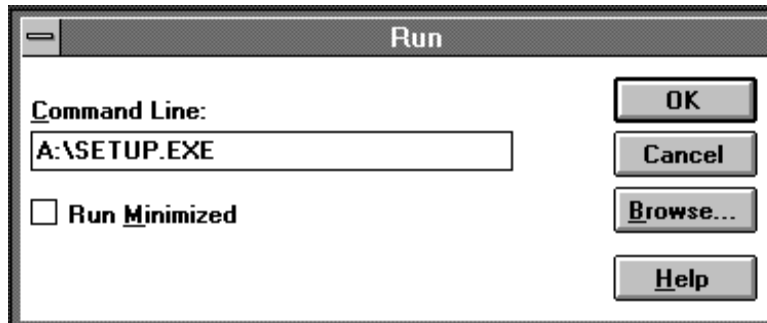


Figure 3-2 Entering the Command Line

5. Press ENTER. This will start the installation program.
6. When "C:\FDEWIN" appears, press ENTER to install FDE for Windows on the displayed drive and directory. See Figure 3-3.

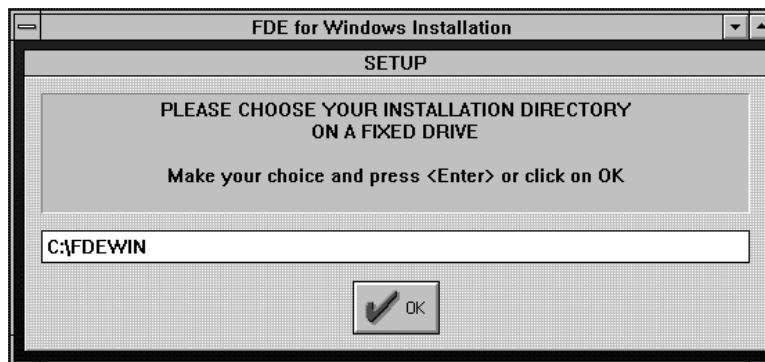


Figure 3-3 The FDE for Windows Installation Screen

7. If your computer has more than one hard disk, select the drive where FDE for Windows will be installed.
8. To install FDE for Windows in a different drive/directory, move the cursor to "C:\FDEWIN" and type in the correct drive and directory. Press ENTER when the drive/directory is correct.
9. When "FDE for Windows Installation Complete" appears, press ENTER to return to the Windows Program Manager.

FDE for Windows is now installed.

10. Connect the 25-pin male end of the serial communication cable (Part Number 132389-1) to the controller RS-232C serial port located on the subpanel of the robot playback box.
11. Connect the other end of the cable to the serial port on the computer. Use the 9-pin adapter (Part Number 132520-1) if necessary.
12. Attach the hardware key to the parallel port LPT1 on the computer.

To start the FDE for Windows program:

13. Select the Motoman Group from the Windows Program Manager.
14. Double click on the FDE for Windows icon. See Figure 3-4.

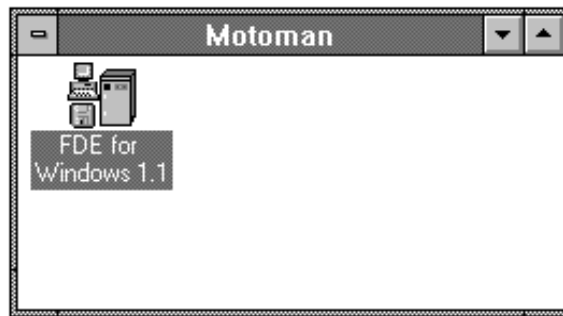


Figure 3-4 The FDE for Windows Icon

This will start the FDE for Windows program and open the FDE for Windows screen. See Figure 3-5.

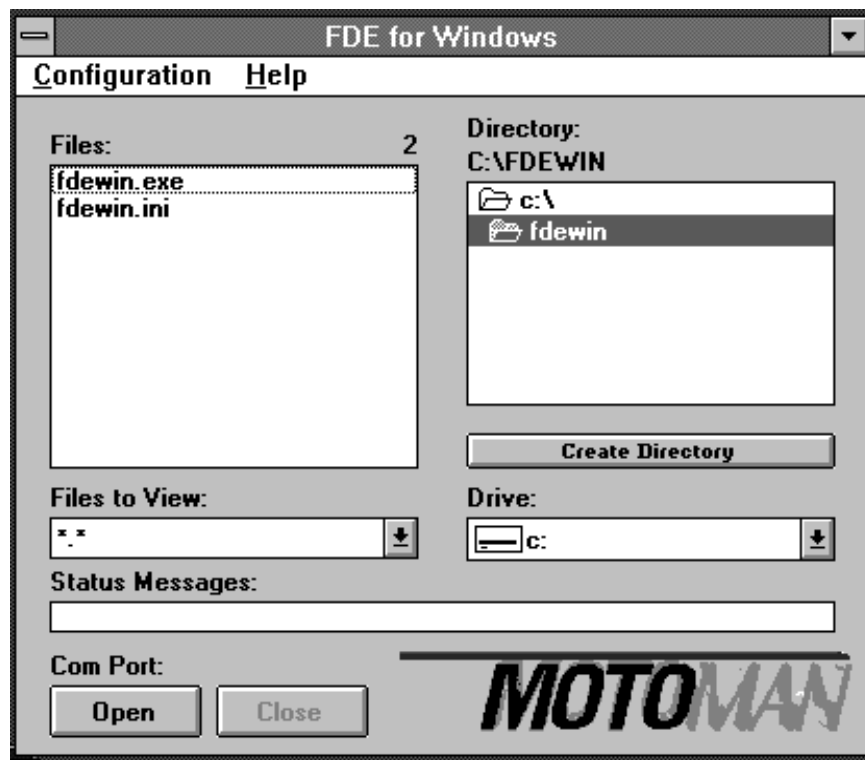


Figure 3-5 The FDE for Windows Screen

15. Open the Configuration menu and select the Settings option. You can do this with the mouse or by pressing Ctrl + S.

This opens the FDE Configuration screen. See Figure 3-6. To configure the program for your application:

16. Set the serial port used by FDE for Windows (Com 1 thru Com 4 are supported). Choose the port that connects to the cable.
17. Set the baud rate, the data bits, the parity, and the stop bits for communication between the computer and the robot controller. The defaults are 4800, 8, Even, and 1.

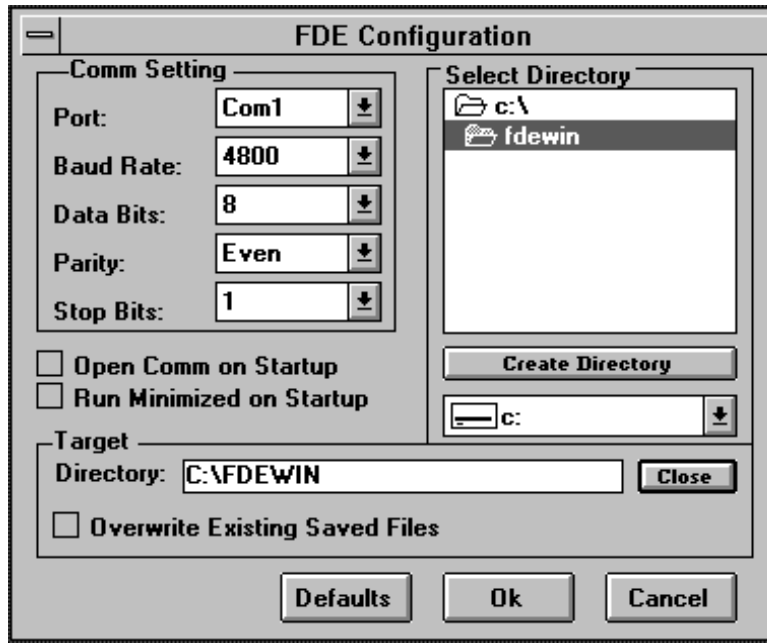


Figure 3-6 The FDE Configuration Screen

18. Select the "Open Comm on Startup" box if you want the FDE for Windows program to launch automatically on startup of the program. An X will appear if you click on the box to indicate that this option is selected.
19. Select "Run Minimized on Startup" if you want to display the small "FDE for Windows" icon on the main Windows File Manager screen when the FDE for Windows program is running. An X will appear if you click on the box to indicate that this option is selected.
20. The target directory specifies the path where the robot data will be stored and retrieved. To select the target directory, click the "Dir" box and double-click on the desired directory. The drive can be any valid hard or floppy drive. The path can be any existing valid directory path. The installation program will set this line based upon the values specified for the disk drive and path during the install process. Refer to step 7 above.
21. Select "Overwrite Existing Saved Files" if you want to allow existing files in the computer to be overwritten by the robot controller without displaying an error message. An X will appear if you click on the box to indicate that this option is selected. When the overwrite option is not selected the user will get an error message when a job transferred from the robot controller has the same name as a job existing in the computer.
22. Click on the "OK" box if you want to accept the configuration choices you have made. The FDE for Windows screen will appear. Or, click on the "Cancel" box to exit the FDE Configuration screen without saving any

changes. If you click on the "Default" box, all the configuration settings will change to the default installation settings.

23. In the FDE for Windows screen, select "Open" to open the com port and enable the transfer of files.

At this point, data transfer can begin. If you have an ERC controller, refer to Section 4 for the transfer procedures. If you have an MRC controller, refer to Section 5 for the transfer procedures.

NOTES

4.0 OPERATING FDE FOR WINDOWS WITH AN ERC CONTROLLER

This section contains instructions for the operation of the FDE for Windows Package (Part Number 132825-1 or 132825-2) with an ERC controller.

Refer to the following sections for data transfer procedure:

- Jobs (Section 4.3)
- Conditional Program Data (Section 4.4)
- All User's Programs (Section 4.5)
- Parameters (Section 4.6)
- I/O System Data (Section 4.7)
- All Data in CMOS (Section 4.8)
- Others (Section 4.9)

All data transfers must be initiated from the robot controller. All program functions are carried out on the control panel of the robot controller. The file transfer status can be viewed from the computer. When information transfer is finished, press Ctrl + X (or double click the system control box in the upper left corner of the screen) to exit the program.

4.1 MEMORY DISPLAY LIMITATIONS

More than 120 files can be saved by the ERC into a single subdirectory, but the ERC will only be able to recognize and load the first 120 files within a directory on the personal computer (PC). If you have more than 120 files, separate sub-directories must be created with no more than 120 files in each subdirectory.

4.2 FORMATTING DISKS

The FORMAT function on the ERC controller will not work with the FDE for Windows program. This is to protect the hard drive from being formatted by accident and because of the various PC floppy diskette format configurations. All diskettes must be formatted from the PC using DOS or Windows.

4.3 JOBS

Jobs should be saved to the PC on a regular basis. A twice-monthly backup system is recommended. This will ensure that a recent copy is on hand if a job on the ERC has been deleted, corrupted, or inadvertently changed.

It is possible to save all jobs on the ERC to disk (see Section 4.3.1), save selected jobs on the ERC to disk (see Section 4.3.2), or load jobs from disk to the ERC (see Section 4.3.3).

4.3.1 Saving All Jobs

To save all jobs from the ERC to disk, follow these steps:

NOTE: If the disk has insufficient space available or is write protected, an error will be displayed on the ERC screen.

1. Press OP1.
2. Press FLOPPY.
3. Press SAVE. A directory of files will appear on the screen.
4. Press ALL JOB.
5. Press EXECUTE.
6. Press BATCH.
7. Press EXECUTE.

The selected information will now be transferred to the PC in the drive and directory path specified in the target directory in the FDE Configuration screen.

4.3.2 Saving Selected Jobs

To save selected jobs from the ERC to disk, follow these steps:

NOTE: The ERC will not overwrite a file that already exists on the disk unless you have OVERWRITE selected in the FDE Configuration screen. Attempting to save a job that is already on disk will generate an error message.

NOTE: If the disk has insufficient space available or is write protected, an error will be displayed on the ERC screen.

1. Press OP1.
2. Press FLOPPY.
3. Press SAVE. A directory of files will appear on the screen.
4. Press SELECT JOB.
5. Move the cursor to the file to be saved.
6. Press SELECT. An asterisk (*) will appear next to the file selected.

NOTE: If a mistake was made in tagging a job that is not to be transferred, move the cursor to the job and press SELECT. This will untag the job.

7. Repeat Steps 5 and 6 as necessary.
8. Press EXIT.
9. Press EXECUTE.

The selected information will now be transferred to the PC in the drive and directory path specified in the FDE Configuration screen.

4.3.3 Loading Jobs

To load jobs from the PC to the ERC, follow these steps:



DANGER!

Do not load data, parameters, or concurrent I/O files from one robot to another without checking operation in Teach or Slow mode. Concurrent I/O and parameter changes can change the way a robot operates. Unexpected operation can cause serious injury or death.

NOTE: If a job on the ERC has the same name as a job to be copied from the PC, the job on the ERC must be renamed or deleted before the job can be copied from the PC to the ERC.

NOTE: Due to memory display limitations on the ERC, a maximum limit of 120 files will be accessible by the ERC (see Section 4.1).

1. Press OP1.
2. Press FLOPPY.
3. Press LOAD. A directory of files will appear on the screen.
4. Press SELECT JOB.
5. Move the cursor to the file to be loaded.
6. Press SELECT. An asterisk (*) will appear next to the file selected.

NOTE: If a mistake was made in tagging a job that is not to be transferred, move the cursor to the job and press SELECT. This will untag the job.

7. Repeat Steps 5 and 6 as necessary.
8. Press EXIT.
9. Press EXECUTE. The selected information will now be transferred to the ERC.

4.4 **CONDITIONAL PROGRAM DATA**

Conditional program data files should be saved periodically and whenever a change has been made. Conditional program data files include weave conditions, welder settings, user coordinate frames, tool frames, and other necessary files.

It is possible to either save conditional program data from the ERC to disk (see Section 4.4.1) or load conditional program data from disk to the ERC (see Section 4.4.2).

4.4.1 **Saving Conditional Program Data**

To save conditional program data from the ERC to disk, follow these steps:

NOTE: The ERC will not overwrite a file that already exists on the disk unless you have OVERWRITE selected in the FDE Configuration screen. Attempting to save a job that is already on disk will generate an error.

NOTE: If the disk has insufficient space available or is write protected, an error will be displayed on the ERC screen.

1. Press OP1.
2. Press FLOPPY.
3. Move the cursor to CONDITIONAL PROGRAM DATA.
4. Press SAVE.
5. Move the cursor to file to be saved.
6. Press EXECUTE.

The selected information will now be transferred to the PC in the drive and directory path specified in the FDE Configuration screen.

4.4.2 **Loading Conditional Program Data**

To load conditional program data files from the PC to the ERC, follow these steps:



DANGER!

Do not load data, parameters, or concurrent I/O files from one robot to another without checking operation in Teach or Slow mode. Concurrent I/O and parameter changes can change the way a robot operates. Unexpected operation can cause serious injury or death.



CAUTION!

The FDE for Windows will overwrite the existing ERC file when loading conditional data files.

NOTE: Due to memory display limitations on the ERC, a maximum limit of 120 files will be accessible by the ERC (see Section 4.1).

1. Press OP1.
2. Press FLOPPY.
3. Move the cursor to CONDITIONAL PROGRAM DATA.
4. Press LOAD.

5. Move the cursor to the file to be loaded to the ERC.
6. Press EXECUTE. The selected information will now be transferred to the ERC.

4.5 ALL USER'S PROGRAMS

All user's programs saves all user programs and files as a single hexadecimal batch file. Saving this file is not necessary if all jobs and conditional data files are saved on a regular basis.

4.6 PARAMETERS

Parameters should be saved to a master disk on a regular basis or whenever they have been changed. The parameters include the soft limits, cubes, speeds, etc.

It is possible to either save parameters from the ERC to disk (see Section 4.6.1) or load parameters from disk to the ERC (see Section 4.6.2).

4.6.1 Saving Parameters

To save parameters from the ERC to disk, follow these steps:

NOTE: The ERC will not overwrite a file that already exists on the disk unless you have OVERWRITE selected in the FDE Configuration screen. Attempting to save a job that is already on disk will generate an error.

NOTE: If the disk has insufficient space available or is write protected, an error will be displayed on the ERC screen.

1. Press OP1.
2. Press FLOPPY.
3. Move the cursor to PARAMETER.
4. Press SAVE.
5. Move the cursor to type of parameter to be saved.
6. Press EXECUTE.

The selected information will now be transferred to the PC in the drive and directory path specified in the FDE Configuration screen.

4.6.2 Loading Parameters

To load parameters from the PC to the ERC, follow these steps:



DANGER!

Do not load data, parameters, or concurrent I/O files from one robot to another without checking operation in Teach or Slow mode. Concurrent I/O and parameter changes can change the way a robot operates. Unexpected operation can cause serious injury or death.



CAUTION!

The FDE for Windows will overwrite the existing ERC file when loading conditional data files.

NOTE: Due to memory display limitations on the ERC, a maximum limit of 120 files will be accessible by the ERC (see Section 4.1).

1. Press OP2.
2. Enter 00000000 (eight zeros) or your code.

NOTE: The default code for this operation is "00000000" (eight zeros), but if the default has been changed, only the user code will work.

3. Press FLOPPY.
4. Move the cursor to PARAMETERS.
5. Press LOAD.
6. Move the cursor to type of parameter to be loaded into memory.
7. Press EXECUTE. The selected information will now be transferred to the ERC.

4.7 I/O SYSTEM DATA

I/O system data includes the concurrent I/O of the system, the signal names, the absolute data of the encoders, and other **very important** files. This data should be saved on a master disk on a regular basis or whenever it has been changed (after recalibrating encoders, for example).

It is possible to either save I/O system data from the ERC to disk (see Section 4.7.1) or load I/O system data from disk to the ERC (see Section 4.7.2).

4.7.1 Saving I/O System Data

To save I/O system data from the ERC to disk, follow these steps:

NOTE: The ERC will not overwrite a file that already exists on the disk unless you have OVERWRITE selected in the FDE Configuration screen. Attempting to save a job that is already on disk will generate an error.

NOTE: If the disk has insufficient space available or is write protected, an error will be displayed on the ERC screen.

1. Press OP1.
2. Press FLOPPY.
3. Move the cursor to I/O System Data.
4. Press SAVE.
5. Move the cursor to file to be saved to disk.
6. Press EXECUTE.

The selected information will now be transferred to the PC in the drive and directory path specified in the FDE Configuration screen.

4.7.2 Loading I/O System Data

To load I/O system data from the PC to the ERC, follow these steps:



DANGER!

Do not load data, parameters, or concurrent I/O files from one robot to another without checking operation in Teach or Slow mode. Concurrent I/O and parameter changes can change the way a robot operates. Unexpected operation can cause serious injury or death.



CAUTION!

The FDE for Windows will overwrite the existing ERC file when loading conditional data files.

NOTE: Due to memory display limitations on the ERC, a maximum limit of 120 files will be accessible by the ERC (see Section 4.1).

1. Press OP2.
2. Enter 00000000 (eight zeros) or your code.

NOTE: The default code for this operation is "00000000" (eight zeros), but if the default has been changed, only the user code will work.

3. Press FLOPPY.
4. Move the cursor to I/O SYSTEM DATA.
5. Press LOAD.

6. Move the cursor to file to be loaded into ERC.
7. Press EXECUTE. The selected information will now be transferred to the ERC.

4.8 ALL DATA IN CMOS

All data in CMOS is a large hexadecimal file that includes all the data in the system. It is normally only saved on a master disk when extensive changes have been made to the system. It is used as an emergency backup for major system failures.

It is possible to either save all data in CMOS from the ERC to disk (see Section 4.8.1) or load all data in CMOS from disk to the ERC (see Section 4.8.2.)

4.8.1 Saving All Data in CMOS

To save all data in CMOS from the ERC to disk, follow these steps:

NOTE: The ERC will not overwrite a file that already exists on the disk unless you have OVERWRITE selected in the FDE Configuration screen. Attempting to save a job that is already on disk will generate an error.

NOTE: If the disk has insufficient space available or is write protected, an error will be displayed on the ERC screen.

1. Press OP1.
2. Press FLOPPY.
3. Move the cursor to ALL DATA IN CMOS.
4. Press SAVE.
5. Press EXECUTE.

The selected information will now be transferred to the PC in the drive and directory path specified in the FDE Configuration screen.

4.8.2 Loading All Data in CMOS

To load all data in CMOS from the PC to the ERC, follow these steps:



DANGER!

Do not load data, parameters, or concurrent I/O files from one robot to another without checking operation in Teach or Slow mode. Concurrent I/O and parameter changes can change the way a robot operates. Unexpected operation can cause serious injury or death.



CAUTION!

The FDE for Windows will overwrite the existing ERC file when loading conditional data files.

NOTE: Due to memory display limitations on the ERC, a maximum limit of 120 files will be accessible by the ERC (see Section 4.1).

1. Press OP1.
2. Press FLOPPY.
3. Move the cursor to ALL DATA IN CMOS.
4. Press LOAD.
5. Press EXECUTE. The selected information will now be transferred to the ERC.

4.9 OTHER FLOPPY FEATURES

Other floppy features include verifying jobs (see Section 4.9.1) or deleting files (see Section 4.9.2).

4.9.1 Verifying Jobs

The VERIFY key allows the operator to ensure that what was saved to disk is the same as what is in the ERC. This is a way of determining if the latest revision of a program has been saved. Because it is slow, this function is not normally used. The quickest way to determine if a job has been changed since last being saved to disk is to check the job list. The SAVED column will only be indicated if the program has not been changed since being saved to disk.

To verify PC and ERC data, follow these steps:

1. Press OP1.
2. Press FLOPPY.
3. Press VERIFY. A directory of files will appear on the screen.
4. Press SELECT JOB.
5. Move the cursor to the file to be verified.
6. Press SELECT. An asterisk (*) will appear next to the file selected.
7. Repeat Steps 5 and 6 as necessary.
8. Press EXIT.
9. Press EXECUTE. The selected information will now be verified.

NOTE: If any differences occur during the verification process, an error will be displayed on the ERC screen.

4.9.2

Deleting Files



CAUTION!

Deleting a file is permanent and the file cannot be recovered if accidentally erased.

The Delete function will delete files from the disk, not the ERC memory. You may wish to use DOS or Windows rather than the Delete function to delete files from the PC.

To delete data on the PC, follow these steps:

NOTE: If your jobs are on a floppy disk, make sure the floppy disk is not write protected.

1. Press OP1.
2. Press FLOPPY.
3. Press DELETE.

A directory of files will appear on the screen.

4. Press SELECT JOB.
5. Move the cursor to the file to be deleted.
6. Press SELECT.

An asterisk (*) will appear next to the file selected.

7. Repeat Steps 5 and 6 as necessary.
8. Press EXIT.
9. Press EXECUTE.

The selected files will now be deleted from the PC.

5.0 OPERATING FDE FOR WINDOWS WITH AN MRC CONTROLLER

This section contains instructions for the operation of the FDE for Windows Package (Part Number 132825-1 or 132825-2) with an MRC controller.

Refer to the following sections for data transfer procedures:

- Jobs (Section 5.4)
- Conditional Files / Universal Data (Section 5.5)
- Batch Standard User Memory (Section 5.6)
- Parameters (Section 5.7)
- C. I/O Program / I/O Name (Section 5.8)
- Customer Data (Section 5.9)
- Batch Standard CMOS (Section 5.10)
- All CMOS Area (Section 5.11)
- Others (Section 5.12)

All data transfers must be initiated from the robot controller. All program functions are carried out on the control panel of the robot controller. The file transfer status can be viewed from the personal computer (PC). When information transfer is finished, close the communication port and select "Exit" from the configuration menu (or press Ctrl + X).

5.1 MEMORY DISPLAY LIMITATIONS

More than 230 files can be saved by the MRC into a single subdirectory, but the MRC will only be able to recognize and load the first 230 files within a directory on the PC. If you have more than 230 files, separate subdirectories must be created with no more than 230 files in each subdirectory.

5.2 FORMATTING DISKS

The FORMAT function on the MRC controller will not work with the FDE for Windows program. This is to protect the hard drive from being formatted by accident and because of the various PC floppy diskette format configurations. All diskettes must be formatted from the PC using DOS or Windows.

5.3 SETTING THE COMMUNICATIONS

Set the MRC Controller communications port settings (the FC1 settings):

1. Press Customer.
2. Press More.

3. Press Org.
4. Press 00000000 (eight zeros) or your code.

NOTE: The default code for this operation is "00000000" (eight zeros), but if the default was changed, only the user code will work.

5. Press PRMTR.
6. Press More.
7. Press RS.
8. Change the communications to match the configuration set in the FDE for Windows package as follows:
 - For the connector on the control panel (DB25), set RS-0000 to 3 (the default is 3).
 - For the connector on the internal I/O rack (DB9), set RS-0001 to 3 (the default is 0).
 - Data bits: RS-0050 = 7 : 7 bits
8 : 8 bits (default)
 - Stop bits: RS-0051 = 0 : 1 bits (default)
1 : 1.5 bits
2 : 2 bits
 - Parity: RS-0052 = 0 : none
1 : odd
2 : even (default)
 - Baud rate: RS-0053 = 1 : 150
2 : 300
3 : 600
4 : 1200
5 : 2400
6 : 4800 (default)
7 : 9600
8 : 19200 (may result in communication errors)

5.4 JOBS

Jobs should be saved to the PC on a regular basis. A twice-monthly backup system is recommended. This will ensure that a recent copy is on hand if a job on the MRC has been deleted, corrupted, or inadvertently changed.

It is possible to save all jobs on the MRC to disk (see Section 5.4.1), save selected jobs on the MRC to disk (see Section 5.4.2), or load jobs from disk to the MRC (see Section 5.4.3).

5.4.1 Saving All Jobs

To save all jobs from the MRC to disk, follow these steps:

NOTE: If the disk has insufficient space available or is write protected, an error will be displayed on the MRC screen.

1. Press FUNC.
2. Press FDD.
3. Press FC1.
4. Move the cursor to JOB.
5. Press SAVE.
6. Press BATCH.
7. Press EXECUTE.

The selected information will now be transferred to the PC in the drive and directory path specified in the FDE Configuration screen.

5.4.2 Saving Selected Jobs

To save selected jobs from the MRC to disk, follow these steps:

NOTE: The MRC will not overwrite a file that already exists on the disk unless you have OVERWRITE selected in the FDE Configuration screen. Attempting to save a job that is already on disk will generate an error.

NOTE: If the disk has insufficient space available or is write protected, an error will be displayed on the MRC screen.

1. Press FUNC.
2. Press FDD.
3. Press FC1.
4. Move the cursor to JOB.
5. Press SAVE.
6. Move the cursor to the job to be saved.
7. Press EACH.

NOTE: If a mistake was made in tagging a job that is not to be transferred, move the cursor to the job and press EACH. This will untag the job.

8. Repeat Steps 6 and 7 until all files to be saved are tagged.
9. Press EXECUTE.

The selected information will now be transferred to the PC in the drive and directory path specified in the FDE Configuration screen.

5.4.3

Loading Jobs

To load jobs from the PC to the MRC, follow these steps:



DANGER!

Do not load data, parameters, or concurrent I/O files from one robot to another without checking operation in Teach or Slow mode. Concurrent I/O and parameter changes can change the way a robot operates. Unexpected operation can cause serious injury or death.

NOTE: If a job on the MRC has the same name as a job to be copied from the PC, the job on the MRC must be renamed or deleted before the job can be copied from the PC to the MRC.

NOTE: Due to memory display limitations on the MRC, a maximum limit of 230 files will be accessible by the MRC (see Section 5.1).

1. Press FUNC.
2. Press FDD.
3. Press FC1.
4. Move the cursor to JOB.
5. Press LOAD.
The screen will show all the jobs on the disk.
6. If all the jobs on disk are to be loaded, press BATCH. If only a few jobs are to be loaded, move the cursor to the job and press EACH until all jobs to be loaded are tagged.

NOTE: If a mistake was made in tagging a job that is not to be transferred, move the cursor to the job and press EACH. This will untag the job.

7. Press EXECUTE. The selected information will now be transferred to the MRC.

5.5

CONDITIONAL FILES/UNIVERSAL DATA

Conditional files and universal data should be saved periodically and whenever a change has been made. Conditional files and universal data include weave conditions, welder settings, user coordinate frames, tool frames, and other necessary files.

It is possible to either save conditional files and universal data from the MRC to disk (see Section 5.5.1) or load conditional files and universal data from disk to the MRC (see Section 5.5.2).

5.5.1 Saving Conditional Files/Universal Data

To save conditional files and universal data from the MRC to disk, follow these steps:

NOTE: The MRC will not overwrite a file that already exists on the disk unless you have OVERWRITE selected in the FDE Configuration screen. Attempting to save a job that is already on disk will generate an error.

NOTE: If the disk has insufficient space available or is write protected, an error will be displayed on the MRC screen.

1. Press FUNC.
2. Press FDD.
3. Press FC1.
4. Move the cursor to COND FILE.
5. Press SAVE.
6. If all the jobs on disk are to be loaded, press BATCH. If only a few jobs are to be loaded, move the cursor to the job and press EACH until all jobs to be loaded are tagged.

NOTE: If a mistake was made in tagging a job that is not to be transferred, move the cursor to the job and press EACH. This will untag the job.

7. Press EXECUTE.

The selected information will now be transferred to the PC in the drive and directory path specified in the FDE Configuration screen.

5.5.2 Loading Conditional Files/Universal Data

To load conditional files and universal data from the PC to the MRC, follow these steps:



DANGER!

Do not load data, parameters, or concurrent I/O files from one robot to another without checking operation in Teach or Slow mode. Concurrent I/O and parameter changes can change the way a robot operates. Unexpected operation can cause serious injury or death.



CAUTION!

The FDE for Windows will overwrite the existing MRC file when loading conditional data files.

NOTE: If a job on the MRC has the same name as a job to be copied from the PC, the job on the MRC must be renamed or deleted before the job can be copied from the PC to the MRC.

NOTE: Due to memory display limitations on the MRC, a maximum limit of 230 files will be accessible by the MRC (see Section 5.1).

1. Press FUNC.
2. Press FDD.
3. Press FC1.
4. Move the cursor to COND FILE.
5. Press LOAD.
6. If all the jobs on disk are to be loaded, press BATCH. If only a few jobs are to be loaded, move the cursor to the job and press EACH until all jobs to be loaded are tagged.

NOTE: If a mistake was made in tagging a job that is not to be transferred, move the cursor to the job and press EACH. This will untag the job.

7. Press EXECUTE.

The selected information will now be transferred to the MRC.

5.6 BATCH STANDARD USER MEMORY

This option saves batch standard user memory as a single hexadecimal batch file. Batch standard user memory includes user programs and files. Saving this file is not necessary if all jobs and conditional files and universal data are saved on a regular basis.

It is possible to either save batch standard user memory from the MRC to disk (see Section 5.6.1) or load batch standard user memory from disk to the MRC (see Section 5.6.2).

5.6.1 Saving Batch Standard User Memory

To save batch standard user memory from the MRC to disk, follow these steps:

NOTE: The MRC will not overwrite a file that already exists on the disk unless you have OVERWRITE selected in the FDE Configuration screen. Attempting to save a job that is already on disk will generate an error.

NOTE: If the disk has insufficient space available or is write protected, an error will be displayed on the MRC screen.

1. Press FUNC.
2. Press FDD.
3. Press FC1.
4. Move the cursor to BATCH STD USER MEM.
5. Press SAVE.
6. Press EXECUTE.

The selected information will now be transferred to the PC in the drive and directory path specified in the FDE Configuration screen.

5.6.2 Loading Batch Standard User Memory

To load batch standard user memory from the PC to the MRC, follow these steps:



DANGER!

Do not load data, parameters, or concurrent I/O files from one robot to another without checking operation in Teach or Slow mode. Concurrent I/O and parameter changes can change the way a robot operates. Unexpected operation can cause serious injury or death.



CAUTION!

The FDE for Windows will overwrite the existing MRC file when loading conditional data files.

NOTE: Due to memory display limitations on the MRC, a maximum limit of 230 files will be accessible by the MRC (see Section 5.1).

1. Press FUNC.
2. Press FDD.

3. Press FC1.
4. Move the cursor to BATCH STD USER MEM.
5. Press LOAD.
6. Press EXECUTE. The selected information will now be transferred to the MRC.

5.7 PARAMETERS

Parameters should be saved to a master disk on a regular basis or whenever they have been changed. The parameters include the soft limits, cubes, speeds, etc.

It is possible to either save parameters from the MRC to disk (see Section 5.7.1) or load parameters from disk to the MRC (see Section 5.7.2).

5.7.1 Saving Parameters

To save parameters from the MRC to disk, follow these steps:

NOTE: The MRC will not overwrite a file that already exists on the disk unless you have OVERWRITE selected in the FDE Configuration screen. Attempting to save a job that is already on disk will generate an error.

NOTE: If the disk has insufficient space available or is write protected, an error will be displayed on the MRC screen.

1. Press FUNC.
2. Press FDD.
3. Press FC1.
4. Move the cursor to PARAMETER.
5. Press SAVE.
6. If all the jobs on disk are to be loaded, press BATCH. If only a few jobs are to be loaded, move the cursor to the job and press EACH until all jobs to be loaded are tagged.

NOTE: If a mistake was made in tagging a job that is not to be transferred, move the cursor to the job and press EACH. This will untag the job.

7. Press EXECUTE.

The selected information will now be transferred to the PC in the drive and directory path specified in the FDE Configuration screen.

5.7.2 Loading Parameters

To load parameters from the PC to the MRC, follow these steps:



DANGER!

Do not load data, parameters, or concurrent I/O files from one robot to another without checking operation in Teach or Slow mode. Concurrent I/O and parameter changes can change the way a robot operates. Unexpected operation can cause serious injury or death.



CAUTION!

The FDE for Windows will overwrite the existing MRC file when loading conditional data files.

NOTE: Due to memory display limitations on the MRC, a maximum limit of 230 files will be accessible by the MRC (see Section 5.1).

1. Press CUSTOMER.
2. Press MORE.
3. Press ORG.
4. Enter 00000000 (eight zeros) or your code.

NOTE: The default code for this operation is "00000000" (eight zeros), but if the default has been changed, only the user code will work.

5. Press ENTER.
6. Press MORE.
7. Press FDD.
8. Press FC1.
9. Move the cursor to PARAMETERS.
10. Press LOAD.
11. If all the jobs on disk are to be loaded, press BATCH. If only a few jobs are to be loaded, move the cursor to the job and press EACH until all jobs to be loaded are tagged.

NOTE: If a mistake was made in tagging a job that is not to be transferred, move the cursor to the job and press EACH. This will untag the job.

12. Press EXECUTE. The selected information will now be transferred to the MRC.

5.8 **C. I/O PROGRAM / I/O NAME**

This option includes the concurrent I/O program of the system, the signal names, the absolute data of the encoders, and other **very important** files. The option for concurrent I/O program data in the MRC display is abbreviated "C. I/O Program / I/O Name". This data should be saved on a master disk on a regular basis or whenever it has been changed (after recalibrating encoders, for example).

It is possible to either save concurrent I/O program data from the MRC to disk (see Section 5.8.1) or load concurrent I/O program data from disk to the MRC (see Section 5.8.2).

5.8.1 **Saving C. I/O Program / I/O Name**

To save concurrent I/O program data from the MRC to disk, follow these steps:

NOTE: The MRC will not overwrite a file that already exists on the disk unless you have OVERWRITE selected in the FDE Configuration screen. Attempting to save a job that is already on disk will generate an error.

NOTE: If the disk has insufficient space available or is write protected, an error will be displayed on the MRC screen.

1. Press FUNC.
2. Press FDD.
3. Press FC1.
4. Move the cursor to C. I/O PROGRAMS.
5. Press SAVE.
6. If all the jobs on disk are to be loaded, press BATCH. If only a few jobs are to be loaded, move the cursor to the job and press EACH until all jobs to be loaded are tagged.

NOTE: If a mistake was made in tagging a job that is not to be transferred, move the cursor to the job and press EACH. This will untag the job.

7. Press EXECUTE.

The selected information will now be transferred to the PC in the drive and directory path specified in the FDE Configuration screen.

5.8.2 Loading C. I/O Program / I/O Name

To load concurrent I/O program data from the PC to the MRC, follow these steps:



DANGER!

Do not load data, parameters, or concurrent I/O files from one robot to another without checking operation in Teach or Slow mode. Concurrent I/O and parameter changes can change the way a robot operates. Unexpected operation can cause serious injury or death.



CAUTION!

The FDE for Windows will overwrite the existing MRC file when loading conditional data files.

NOTE: Due to memory display limitations on the MRC, a maximum limit of 230 files will be accessible by the MRC (see Section 5.1).

1. Press CUSTOMER.
2. Press MORE.
3. Press ORG.
4. Enter 00000000 (eight zeros) or your code.

NOTE: The default code for this operation is "00000000" (eight zeros), but if the default has been changed, only the user code will work.

5. Press ENTER.
6. Press MORE.
7. Press FDD.
8. Press FC1.
9. Move the cursor to DATA TYPE.
10. Press LOAD.
11. If all the jobs on disk are to be loaded, press BATCH. If only a few jobs are to be loaded, move the cursor to the job and press EACH until all jobs to be loaded are tagged.

NOTE: If a mistake was made in tagging a job that is not to be transferred, move the cursor to the job and press EACH. This will untag the job.

12. Press EXECUTE. The selected information will now be transferred to the MRC.

5.9 CUSTOMER DATA

Customer data includes absolute data, specified point, alarm histories, and other very important files. Customer data should be saved on a master disk and whenever it has been changed (after encoder calibration, for example).

It is possible to either save customer data from the MRC to disk (see Section 5.9.1) or load customer data from disk to the MRC (see Section 5.9.2).

5.9.1 Saving Customer Data

To save customer data from the MRC to disk, follow these steps:

NOTE: The MRC will not overwrite a file that already exists on the disk unless you have OVERWRITE selected in the FDE Configuration screen. Attempting to save a job that is already on disk will generate an error.

NOTE: If the disk has insufficient space available or is write protected, an error will be displayed on the MRC screen.

1. Press FUNC.
2. Press FDD.
3. Press FC1.
4. Move the cursor to CUST DATA.
5. Press SAVE.
6. If all the jobs on disk are to be loaded, press BATCH. If only a few jobs are to be loaded, move the cursor to the job and press EACH until all jobs to be loaded are tagged.

NOTE: If a mistake was made in tagging a job that is not to be transferred, move the cursor to the job and press EACH. This will untag the job.

7. Press EXECUTE.

The selected information will now be transferred to the PC in the drive and directory path specified in the FDE Configuration screen.

5.9.2 Loading Customer Data

To load customer data from the PC to the MRC, follow these steps:



DANGER!

Do not load data, parameters, or concurrent I/O files from one robot to another without checking operation in Teach or Slow mode. Concurrent I/O and parameter changes can change the way a robot operates. Unexpected operation can cause serious injury or death.



CAUTION!

The FDE for Windows will overwrite the existing MRC file when loading conditional data files.

NOTE: Due to memory display limitations on the MRC, a maximum limit of 230 files will be accessible by the MRC (see Section 5.1).

1. Press CUSTOMER.
2. Press MORE.
3. Press ORG.
4. Enter 00000000 (eight zeros) or your code.

NOTE: The default code for this operation is "00000000" (eight zeros), but if the default has been changed, only the user code will work.

5. Press ENTER.
6. Press MORE.
7. Press FDD.
8. Press FC1.
9. Move the cursor to CUST DATA.
10. Press LOAD.
11. If all the jobs on disk are to be loaded, press BATCH. If only a few jobs are to be loaded, move the cursor to the job and press EACH until all jobs to be loaded are tagged.

NOTE: If a mistake was made in tagging a job that is not to be transferred, move the cursor to the job and press EACH. This will untag the job.

12. Press EXECUTE.

The selected information will now be transferred to the MRC.

5.10 BATCH STANDARD CMOS

Batch standard CMOS is a large hexadecimal file that includes all the batch data in the system. It is normally only saved on a master disk when extensive changes have been made to the system. It is used as an emergency backup for major system failures.

It is possible to either save batch standard CMOS from the MRC to disk (see Section 5.10.1) or load batch standard CMOS from disk to the MRC (see Section 5.10.2).

5.10.1 **Saving Batch Standard CMOS**

To save batch standard CMOS from the MRC to disk, follow these steps:

NOTE: The MRC will not overwrite a file that already exists on the disk unless you have OVERWRITE selected in the FDE Configuration screen. Attempting to save a job that is already on disk will generate an error.

NOTE: If the disk has insufficient space available or is write protected, an error will be displayed on the MRC screen.

1. Press FUNC.
2. Press FDD.
3. Press FC1.
4. Move the cursor to BATCH STD CMOS.
5. Press SAVE.
6. Press EXECUTE.

The selected information will now be transferred to the PC in the drive and directory path specified in the FDE Configuration screen.

5.10.2 **Loading Batch Standard CMOS**

To load batch standard CMOS from the PC to the MRC, follow these steps:



DANGER!

Do not load data, parameters, or concurrent I/O files from one robot to another without checking operation in Teach or Slow mode. Concurrent I/O and parameter changes can change the way a robot operates. Unexpected operation can cause serious injury or death.



CAUTION!

The FDE for Windows will overwrite the existing MRC file when loading conditional data files.

NOTE: Due to memory display limitations on the MRC, a maximum limit of 230 files will be accessible by the MRC (see Section 5.1).

1. Press CUSTOMER.
2. Press MOVE.
3. Press ORG.
4. Enter 00000000 (8 zeros) or your code.

NOTE: The default code for this operation is "00000000" (eight zeros), but if the default has been changed, only the user code will work.

5. Press ENTER.
6. Press MORE.
7. Press FDD.
8. Press FC1.
9. Move the cursor to BATCH STD CMOS.
10. Press LOAD.
11. Press EXECUTE. The selected information will now be transferred to the MRC.

5.11 ALL CMOS AREA

All CMOS area is a large hexadecimal file that includes all the data (including the batch data) in the system. It is normally only saved on a master disk when extensive changes have been made to the system. It is used as an emergency backup for major system failures.

It is possible to either save all CMOS area from the MRC to disk (see Section 5.11.1) or load all CMOS area from disk to the MRC (see Section 5.11.2).

5.11.1 Saving All CMOS Area

To save all CMOS area from the MRC to disk, follow these steps:

NOTE: The MRC will not overwrite a file that already exists on the disk unless you have OVERWRITE selected in the FDE Configuration screen. Attempting to save a job that is already on disk will generate an error.

NOTE: If the disk has insufficient space available or is write protected, an error will be displayed on the MRC screen.

1. Press FUNC.
2. Press FDD.
3. Press FC1.
4. Move the cursor to ALL CMOS AREA.
5. Press SAVE.
6. Press EXECUTE.

The selected information will now be transferred to the PC in the drive and directory path specified in the FDE Configuration screen.

5.11.2 **Loading All CMOS Area**

To load all CMOS area from the PC to the MRC, follow these steps:



DANGER!

Do not load data, parameters, or concurrent I/O files from one robot to another without checking operation in Teach or Slow mode. Concurrent I/O and parameter changes can change the way a robot operates. Unexpected operation can cause serious injury or death.



CAUTION!

The FDE for Windows will overwrite the existing MRC file when loading conditional data files.

NOTE: Due to memory display limitations on the MRC, a maximum limit of 230 files will be accessible by the MRC (see Section 5.1).

1. Press CUSTOMER.
2. Press MOVE.
3. Press ORG.
4. Enter 00000000 (8 zeros) or your code.

NOTE: The default code for this operation is "00000000" (eight zeros), but if the default has been changed, only the user code will work.

5. Press ENTER.
6. Press MORE.
7. Press FDD.
8. Press FC1.
9. Move the cursor to ALL CMOS AREA.
10. Press LOAD.
11. Press EXECUTE. The selected information will now be transferred to the MRC.

5.12 OTHER FLOPPY FEATURES

Other floppy features include verifying jobs (see Section 5.12.1) or deleting files (see Section 5.12.2).

5.12.1 **Verifying Jobs**

The VERIFY key allows the operator to ensure that what was saved to disk is the same as what is in the MRC. This is a way of determining if the latest revision of a program has been saved. Because it is slow, this function is not normally used. The quickest way to determine if a job has been changed since last being saved to disk is to check the job list. The SAVED column will only be indicated if the program has not been changed since being saved to disk.

To verify PC and MRC data, follow these steps:

1. Press FUNC.
2. Press FDD.
3. Press FC1.
4. Move the cursor to type of data to be verified.
5. Press VERIFY. The screen will show all the jobs on the disk.
6. If all the jobs on disk are to be loaded, press BATCH. If only a few jobs are to be loaded, move the cursor to the job and press EACH until all jobs to be loaded are tagged.

NOTE: If a mistake was made in tagging a job that is not to be transferred, move the cursor to the job and press EACH. This will untag the job.

7. Press EXECUTE. The selected information will now be verified.

NOTE: If any differences occur during the verification process, an error will be displayed on the MRC screen.

5.12.2 **Deleting Files**



CAUTION!

Deleting a file is permanent and the file cannot be recovered if accidentally erased.

The Delete function will delete files from the disk, not the MRC memory. You may wish to use DOS or Windows rather than the Delete function to delete files from the PC.

To delete data on the PC, follow these steps:

NOTE: If your jobs are on a floppy disk, make sure the floppy disk is not write protected. Refer to Section 1.5.

1. Press FUNC.
2. Press FDD.
3. Press FC1.
4. Move the cursor to type of data to be deleted.

5. Press DELETE. The screen will show all the files of the specified data type on the disk.
6. If all the jobs on disk are to be deleted, press BATCH. If only a few jobs are to be deleted, move the cursor to the job and press EACH until all jobs to be deleted are tagged.

NOTE: If a mistake was made in tagging a job that is not to be transferred, move the cursor to the job and press EACH . This will untag the job.

7. Press EXECUTE. The selected files will now be deleted from the PC.

6.0 TROUBLESHOOTING

If FDE for Windows is not installed or configured correctly, the controller will display an error or alarm on the screen. Some of the errors, causes, and corrective actions are displayed below.

See the appropriate Programming Manual for additional error codes.

Table 6-1 Troubleshooting (for ERC Controllers)

Alarm No.	Message	Cause	Remedy
2030	Duplicate job name.	The job already exists in the robot controller and you are trying to overwrite the file from FDE for Windows.	You cannot overwrite an existing file. To load a file from floppy disk into the robot controller, the duplicate file in the robot controller must be erased.
4010	Connect cable of floppy disk drive.	Cable is loose or not connected to the robot controller. The communication parameter (baud rate) has been changed.	Plug in the cable between the robot controller and the PC. Check and correct the communication parameters.
4020	Insert floppy disk.	There is no floppy disk in the floppy disk drive.	Insert a floppy disk or remove the floppy disk from the drive and reinsert.
4030	The floppy disk is protected from WRITE operation.	The floppy disk Write Protect window is open.	Ensure that the Write Protect window (the small square slide located on the lower left side of the disk) is closed and locked.
4050	The file already exists on the floppy disk.	The file is already on the floppy disk.	Erase the file on the floppy disk.
4096 4097	Transmission error with floppy disk drive.	The serial cable connection is bad. The cable came loose during transmission of files. Wrong communication settings.	Ensure that the RS-232C serial cable is secured at both ends. Ensure that the communication settings are correct. See Section 3.2.

Table 6-1 Troubleshooting (for ERC Controllers) - continued

Alarm No.	Message	Cause	Remedy
4110	Syntax error.	The file has been corrupted by using the incorrect symbol for editing the command. For example, misspelling AWELD as WWELD.	Edit the file and correct the error. If the error cannot be found, delete the file and start over.
4170	Format error.	The file format has been changed.	Check the file structure on an IBM-compatible computer. Correct error if noted. Do not attempt to load the file into the robot controller until the error is corrected. If it cannot be corrected, erase the file and start over.
4250	The file is not allowed to load.	You are trying to load a file such as a parameter data file from the OP1 FLOPPY menu.	If the file needs to be loaded, it is necessary to use the OP2 function menu.
	Problems recording to the floppy disk drive.	The ERC controller TAPE OUT switch is not set correctly. The cable is plugged in incorrectly.	Ensure that the cable ends are attached correctly to the controller and the PC. Ensure that all parameters are set correctly on the floppy disk recorder.

Table 6-2 Troubleshooting (for MRC Controllers)

Error No.	Message	Cause	Remedy
3010	Floppy disk drive cable not connected.	Cable connection error on floppy disk drive or power not supplied (no response from floppy disk drive).	Connect cable. Ensure FDE for Windows is running and com port is open.
3020	Floppy disk not inserted into floppy disk drive.	There is no floppy disk in the floppy disk drive.	Insert a floppy disk or remove the floppy disk from the drive and reinsert.
3030	Floppy disk protection is ON.	The floppy disk is set to write prohibit.	Ensure that the write protect window (the small square slide located on the lower left side of the disk) is closed and locked.
3040	File not saved on floppy disk.	The file is not saved on the floppy disk.	Save the file on the floppy disk.
3050	File saved on floppy disk.	The file is already on the floppy disk.	Erase the file on the floppy disk.
3060	Out of memory on floppy disk.	No space in storage area in floppy disk.	Insert a new floppy disk into the floppy disk drive.
3070	Number of files on floppy disk is full.	Too many files in the directory.	Copy files to a different directory or select a different directory.
3080	I/O error on floppy disk.	Excess allowance number of retransmissions.	Try a new disk.
3090	Transmission error with floppy disk drive.	Framing error. Overrun error. Parity error.	Check the communications parameters on the controller and the computer. If the error continues, select a lower baud rate.

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