

MotoSoft™

MotoFTP User's Manual

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Chapter 1

Introduction

MotoFTP is a PC-based software package that enables file transfer between a host computer and the robot controller using FTP (File Transfer Protocol). The FTP server function allows robot job files (.jbi), data files (.dat) condition files (.cnd), parameter files (.prm), and system files (.sys) to be saved directly to the host computer. MotoFTP also enables job, data, and condition files to be loaded from the host computer directly to the controller.

1.1 About This Document

This manual is intended as an introduction and overview for personnel who have received operator training from Motoman, and who are familiar with the operation of their Motoman robot model and Microsoft® Windows®/ PC usage. For more detailed information, refer to the manuals listed in Section 1.3. This manual contains the following sections:

SECTION 1 - INTRODUCTION

This section provides general information about MotoFTP, a list of reference documents, and customer service information.

SECTION 2 - SAFETY

This section provides information regarding the safe use and operation of the MotoFTP software.

SECTION 3 - INSTALLATION AND OPERATION

Provides instructions for ALogic 2 software installation, and first time use.

1.2 System Requirements

MotoFTP requires an additional 25-30 megabytes of hard disk space. MotoFTP on-line help requires Microsoft Internet Explorer 4.0 or later and is provided on the Motoman CD Browser.

1.3 Reference to Other Documentation

For additional information refer to the following:

- Manipulator Manual for your robot model
- Operator's Manual for your application
- Vendor manuals for system components not manufactured by Motoman

1.4 Customer Service Information

If you are in need of technical assistance, contact the Motoman service staff at (937) 847-3200. Please have the following information ready before you call:

- Software version
- Operating system (Microsoft Windows 95/98/NT/2000, XP)
- System configuration (hard disk capacity, memory, software, etc.)
- List of all software installed after shipment from Motoman
- Description of difficulty (make note of any error messages)
- Application specific information including robot jobs, process details etc...
- Robot Serial Number (located on back side of robot arm)
- Robot Sales Order Number (located on front door of controller)

Chapter 2

Safety

2.1 Introduction

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: (734) 994-6088

FAX: (734) 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 (Section 2.2)
- General Safeguarding Tips (Section 2.3)
- Mechanical Safety Devices (Section 2.4)
- Installation Safety (Section 2.5)
- Programming Safety (Section 2.6)
- Operation Safety (Section 2.7)
- Maintenance Safety (Section 2.8)

2.2 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.

2.3 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 to 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).

2.4 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.

2.5 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.

2.6 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 XRC 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 result in personal injury and/or damage to 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.

2.7 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 result in personal injury and/or damage to 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.

2.8 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 result in personal injury and/or damage to 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).

Chapter 3

Installation and Setup

3.1 XRC Setup

The XRC controller must be equipped with the optional Ethernet board (142402-1) to be capable of transferring files via FTP. MotoFTP is designed as an application of the Data Transmission Function. The FTP data transmission parameter for the XRC must be turned ON prior to using MotoFTP. Contact your local Motoman representative to have this parameter turned ON.

Table 4 FTP Transmission Parameters

Parameter	Contents	Initial Setting	Recommended Setting
RS034	TIMER A: monitors sequence. Specifies the response waiting time for invalid or missing responses in units of 0.1 sec. Setting range: 0 to 100	30	100
RS035	TIMER B: monitors text reception. Specifies the monitoring time to wait for the termination character in units of 0.1 sec. Setting range: 0 to 255	200	200



Note: Additional information can be found in the Ethernet I/F Board Instruction Manual (P/N 142974-1) and the FTP Function Instruction Manual (P/N 145603-1).

3.1.1 Remote Mode

The XRC controller must be in Remote mode with Command Remote sub-mode enabled, to use MotoFTP. To place the XRC in remote mode, either

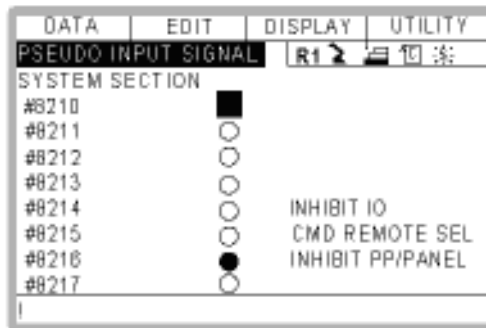
- Press REMOTE on the playback panel, or
- Turn ON the remote selection signal from the external I/O.

To enable the Command Remote sub-mode, proceed as follows:

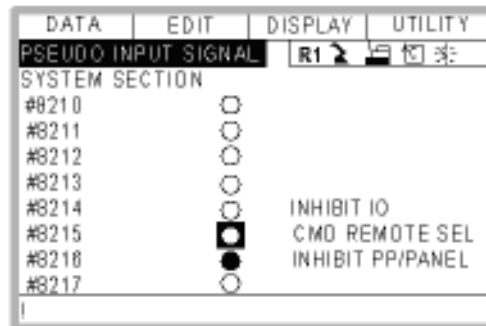


Note: XRC security mode must be set to Management before enabling the Command Remote sub-mode. To change security mode: from the top menu, select MANAGEMENT MODE from the dropdown menu and enter User ID (default User ID value is: 99999999).

1. Verify controller security mode is set to management.
2. From the top menu, select IN/OUT.
3. Select PSEUDO INPUT SIGNAL.
4. Move the cursor to the CMD REMOTE SEL signal.



5. From the programming pendant, press INTERLOCK and SELECT. The CMD REMOTE SEL signal is enabled.



Operation is now directed from the host computer.

3.1.2 FTP ACCOUNTS

The ftp server, residing in the XRC controller, has the following accounts:

Table 5 FTP Accounts for XRC

User Name	Password	Purpose
xmaster	Password for management mode (default: 99999999)	Loading and saving jobs. Loading and saving condition and general data. Saving system information and parameters.
ftp	Arbitrary password	Loading and saving jobs. Loading and saving condition and general data, and saving system information.
anonymous	Arbitrary password	Saving jobs, and condition and general data.

3.2 NX100 Setup

MotoFTP is designed as an application of the Data Transmission Function. The FTP data transmission parameter must be turned ON prior to using MotoFTP. Contact your local Motoman representative to have this parameter turned ON.

Table 6 FTP Transmission Parameters

Parameter	Contents	Initial Setting	Recommended Setting
RS034	TIMER A: monitors sequence. Specifies the response waiting time for invalid or missing responses in units of 0.1 sec. Setting range: 0 to 100	30	100
RS035	TIMER B: monitors text reception. Specifies the monitoring time to wait for the termination character in units of 0.1 sec. Setting range: 0 to 255	200	200

3.2.1 Remote Mode

The NX controller must be in Remote mode with Command Remote sub-mode enabled, to use MotoFTP. To place the NX in remote mode, either

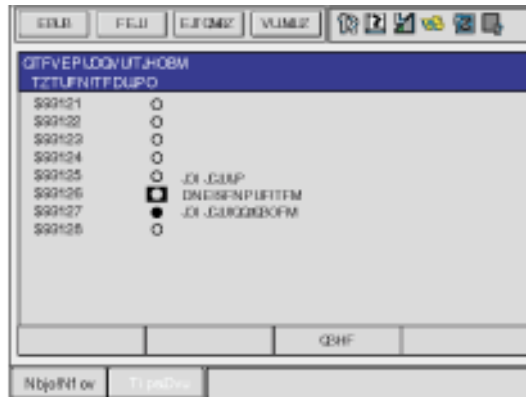
- Set the mode key on the programming pendant to REMOTE, or
- Turn ON the remote selection signal from the external I/O.

To enable the Command Remote sub-mode, proceed as follows:



Note: NX security mode must be set to Management before enabling the Command Remote sub-mode. To change security mode: from the top menu, select MANAGEMENT MODE from the dropdown menu and enter User ID (default: 99999999).

1. Verify controller security mode is set to management.
2. From the top menu, select IN/OUT.
3. Select PSEUDO INPUT SIG.
4. Move the cursor to the CMD REMOTE SEL signal.
5. From the programming pendant, press INTERLOCK and SELECT. The CMD REMOTE SEL signal is enabled.



3.2.2 FTP Accounts

The ftp server which resides on the NX100 controller has the following accounts.

Table 7 FTP Accounts for XRC

User Name	Password	Purpose
nxmaster	Password for management mode (default: 99999999)	Loading and saving jobs. Loading and saving condition and general data. Saving system information and parameters.
ftp	Arbitrary password	Loading and saving jobs. Loading and saving condition and general data, and saving system information.
anonymous	Arbitrary password	Saving jobs, and condition and general data.

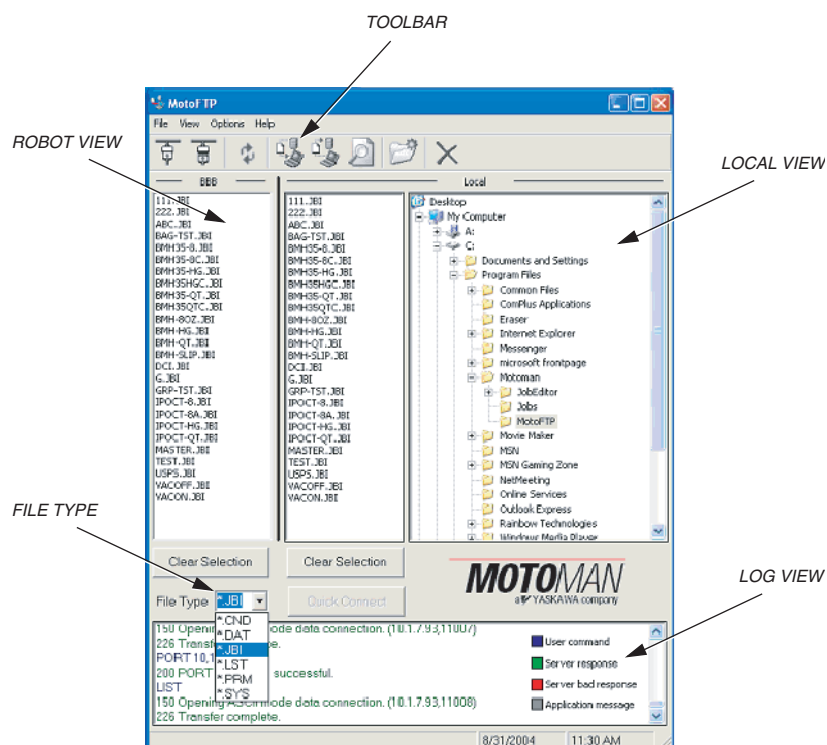
Chapter 4

Operation

This chapter provides detailed operation information for MotoFTP, including detailed step-by-step instructions. To launch MotoFTP, select MotoFTP from the Windows Start menu. MotoFTP is located in the Motoman program group unless you specified another group during installation.

4.1 Overview

Three panes or views are shown on the main screen: Robot View, Local or Computer View, and Log View.



Robot Controller View

When connected to an ftp enabled controller, the list of files that reside in the controller appear in this window.

Local View

The local view appears at the right and is divided into two sections. First is the tree view which lists the directories on the local computer. The second lists the files that appear in the selected directory.









Log View

The log view pane logs all communication requests and responses to and from the robot controller.

File Type Dropdown

The File Type dropdown filters the file view for both the controller and local windows.

4.1.1 Toolbar

	Connect Opens a connection between the host computer and robot controller.
	Disconnect Closes the connection between host computer and robot controller.
	Refresh Refreshes the contents of the current directory.
	Retrieve File from Robot Transfers file from robot controller to host computer.
	Send File to Controller Transfers file from host controller to robot controller.
	Compare Files
	Create Local Folder Creates a new folder in the current host computer directory.
	Delete File Deletes the currently selected file.

4.2 Creating a MotoFTP Connection

To create a MotoFTP connection, proceed as follows:

1. Select File > Connect from the dropdown menu or click on the Connect icon from the toolbar.
The first time you attempt to create a connection, the Connect to... connection editor appears.

When connecting for the first time, you will note that there are no currently saved connections.

2. Enter a Connection Name to identify this connection.
3. Enter the Robot IP Address for the robot you want to connect to.
4. Select the User Name you wish to use from the dropdown list. Refer to FTP ACCOUNTS for information on which to use.



Note: The Anonymous and FTP user names do not require a password. The Xmaster and NXmaster user names use the same password as that used to log into management mode on the controller.

4.2.1 Connection Options

Password Required The Password Required checkbox is ON by default but can be turned OFF. When the checkbox is ON, you must supply a password every time this connection is used.

Default Connection The Default Connection registers this connection as the Quick Connect connection. This can only be used on connections that the Required checkbox is not ON.

Upload Only The Upload Only checkbox automatically sets the User Name to anonymous and supplies the Password.

Once a connection is configured the way you want it, press the ADD button and the connection will be added to the connection list at the left.

Add another connections or select a saved connection from the connection list.

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