

Motoman® NX100 Controller

FTP Function Manual

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Revision: 0

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Chapter 1

Introduction

1.1 About This Document

This Function Manual provides an overview of the complete Motoman FTP Function. For detailed information on any specific system component listed in this document, please refer to the documentation package that is included with your system (refer to Section 1.2).

This Function Manual contains the following chapters –

CHAPTER 1 – INTRODUCTION

This chapter introduces the FTP Function Manual, provides an overview of the FTP Function, lists reference documents that are included with the documentation package, and provides Motoman Customer Support contact information.

CHAPTER 2 – SAFETY

This chapter provides general information regarding the safe installation, maintenance, and operation of the FTP Function.

CHAPTER 3 – INSTRUCTIONS

This chapter provides detailed information for the FTP Function.

1.2 Reference Documentation

For additional information on individual FTP components, refer to the following documentation that is included with your FTP system –

- Motoman *Manipulator Manual*
- Motoman *NX100 Controller Manual* (P/N 149201-1)
- Motoman *NX100 Maintenance Manual* (P/N 150133-1)
- Motoman *NX100 Operator's Manual for your application*
- Motoman *NX100 Concurrent I/O Parameter Manual* (P/N 149230-1)
- Motoman *INFORM User's Manual* (P/N 150078-1)
- Vendor manuals for system components not manufactured by Motoman

1.3 Customer Support Information

If you need technical assistance with your FTP system, please contact Motoman Customer Support at the following 24-hour telephone number –

937. 847. 3200

Please have the following information ready before you call –

- SYSTEM — FTP Function
- ROBOTS — IA20, HP50, EA1900N, etc.
- CONTROLLER — NX100
- PRIMARY APPLICATION — Handling, General
- SOFTWARE VERSION — Access this information on the Programming Pendant display screen by selecting MAIN MENU → SYSTEM INFO → VERSION
- ROBOT SERIAL No — Located on data plate of robot
- ROBOT SALES ORDER No — Located on data plate of NX100 controller
- WARRANTY ID CODE — Located on back of the Programming Pendant

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 R15.06-1999.

Here is RIA contact information –

Robotic Industries Association
900 Victors Way
P.O. Box 3724
Ann Arbor, Michigan 48106
TEL: (734) 994-6088
FAX: (734) 994-3338
www.roboticsonline.com

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 chapter 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, Operation, and Maintenance Safety (Section 2.6)

2.2 Standard Conventions

This manual includes the following alerts – in descending order of severity – that are essential to the safety of personnel and equipment. As you read this manual, pay close attention to these alerts to insure safety when installing, operating, programming, and maintaining this equipment.



DANGER!

Information appearing in a **DANGER** 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 in a **WARNING** 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 in a **CAUTION** 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 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 R15.06-1999, section 4.2.5, Sources of Energy, 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 R15.06-1999 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 equipment is provided as standard –

- Safety fences and barriers
- Light curtains and/or safety mats
- Door interlocks
- Emergency stop palm buttons located on operator station, robot controller, and programming pendant

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 R15.06-1999 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, Operation, and 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. 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 program, operate, and maintain the system. All personnel involved with the operation of the equipment must understand potential dangers of operation.

- 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 all safety equipment for proper operation. Repair or replace any non-functioning safety equipment immediately.
- Do not enter the robot cell while it is in automatic operation. Be sure that only the person holding the programming pendant enters the workcell.
- Check the E-Stop button on the programming pendant for proper operation before programming. The robot must be placed in Emergency Stop (E-Stop) mode whenever it is not in use.
- Back up all programs and jobs onto suitable media before 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.
- Any modifications to PART 1, System Section, of the robot controller concurrent I/O program can cause severe personal injury or death, as well as damage to the robot! Do not make any modifications to PART 1, System Section. 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.
- The robot controller allows modifications of PART 2, User Section, of the concurrent I/O program and modifications to controller parameters for maximum robot performance. Great care must be taken when making these modifications. 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 and other parts of the system. Double-check all modifications under every mode of robot operation to ensure that you have not created hazards or dangerous situations.
- Check and test any new or modified program at low speed for at least one full cycle.
- This equipment has multiple sources of electrical supply. Electrical interconnections are made between the controller and other equipment. Disconnect and lockout/tagout all electrical circuits before making any modifications or connections.
- Do not perform any maintenance procedures before reading and understanding the proper procedures in the appropriate manual.
- Use proper replacement parts.
- 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).

NX100 OPTIONS INSTRUCTIONS

FOR FTP FUNCTION

Upon receipt of the product and prior to initial operation, read these instructions thoroughly, and retain for future reference.

MOTOMAN INSTRUCTIONS

MOTOMAN-□□□ INSTRUCTIONS
NX100 INSTRUCTIONS
NX100 OPERATOR'S MANUAL
NX100 MAINTENANCE MANUAL

The NX100 operator's manuals above corresponds to specific usage.
Be sure to use the appropriate manual.





MANDATORY

- **This manual explains the FTP function of the NX100 system and general operations. Read this manual carefully and be sure to understand its contents before handling the NX100.**
- **General items related to safety are listed in Section 1: Safety of the NX100 Instructions. To ensure correct and safe operation, carefully read the NX100 Instruction before reading this manual.**



CAUTION

- **Some drawings in this manual are shown with the protective covers or shields removed for clarity. Be sure all covers and shields are replaced before operating this product.**
- **The drawings and photos in this manual are representative examples and differences may exist between them and the delivered product.**
- **YASKAWA may modify this model without notice when necessary due to product improvements, modifications, or changes in specifications. If such modification is made, the manual number will also be revised.**
- **If your copy of the manual is damaged or lost, contact a YASKAWA representative to order a new copy. The representatives are listed on the back cover. Be sure to tell the representative the manual number listed on the front cover.**
- **YASKAWA is not responsible for incidents arising from unauthorized modification of its products. Unauthorized modification voids your product's warranty.**

Notes for Safe Operation

Read this manual carefully before installation, operation, maintenance, or inspection of the NX100.

In this manual, the Notes for Safe Operation are classified as “WARNING,” “CAUTION,” “MANDATORY,” or “PROHIBITED.”



WARNING

Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury to personnel.



CAUTION

Indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury to personnel and damage to equipment. It may also be used to alert against unsafe practices.



MANDATORY

Always be sure to follow explicitly the items listed under this heading.



PROHIBITED

Must never be performed.

Even items described as “CAUTION” may result in a serious accident in some situations. At any rate, be sure to follow these important items



To ensure safe and efficient operation at all times, be sure to follow all instructions, even if not designated as “CAUTION” and “WARNING”.



WARNING

- **Before operating the manipulator, check that servo power is turned OFF when the emergency stop buttons on the front door of the NX100 and programming pendant are pressed. When the servo power is turned OFF, the SERVO ON LED on the programming pendant is turned OFF.**

Injury or damage to machinery may result if the emergency stop circuit cannot stop the manipulator during an emergency. The manipulator should not be used if the emergency stop buttons do not function.



- **Once the emergency stop button is released, clear the cell of all items which could interfere with the operation of the manipulator. Then turn the servo power ON.**

Injury may result from unintentional or unexpected manipulator motion.



- **Observe the following precautions when performing teaching operations within the P-point maximum envelope of the manipulator:**
 - **View the manipulator from the front whenever possible.**
 - **Always follow the predetermined operating procedure.**
 - **Ensure that you have a safe place to retreat in case of emergency.**

Improper or unintended manipulator operation may result in injury.

- **Confirm that no persons are present in the P-point maximum envelope of the manipulator and that you are in a safe location before:**
 - **Turning ON the NX100 power.**
 - **Moving the manipulator with the programming pendant.**
 - **Running the system in the check mode.**
 - **Performing automatic operations.**

Injury may result if anyone enters the P-point maximum envelope of the manipulator during operation. Always press an emergency stop button immediately if there is a problem. The emergency stop buttons are located on the right of the front door of the NX100 and the programming pendant.



CAUTION

- **Perform the following inspection procedures prior to conducting manipulator teaching. If problems are found, repair them immediately, and be sure that all other necessary processing has been performed.**

- Check for problems in manipulator movement.**
- Check for damage to insulation and sheathing of external wires.**

- **Always return the programming pendant to the hook on the NX100 cabinet after use.**

The programming pendant can be damaged if it is left in the P-point maximum envelope of the manipulator, on the floor, or near fixtures.

- **Read and understand the Explanation of Warning Labels in the NX100 Instructions before operating the manipulator.**

Definition of Terms Used Often in This Manual


The MOTOMAN manipulator is the YASKAWA industrial robot product.

The manipulator usually consists of the controller, the programming pendant, and supply cables.

In this manual, the equipment is designated as follows:

Equipment	Manual Designation
NX100 controller	NX100
NX100 programming pendant	Programming pendant
Cable between the manipulator and the controller	Manipulator cable

The programming pendant and playback panel keys, buttons, and displays are designated as follows:

Equipment		Manual Designation
Programming Pendant	Character Keys	The keys which have characters printed on them are denoted with []. ex. [ENTER]
	Symbol Keys	The keys which have a symbol printed on them are not denoted with [] but depicted with a small picture. ex. page key  The cursor key is an exception, and a picture is not shown.
	Axis Keys Number Keys	"Axis Keys" and "Number Keys" are generic names for the keys for axis operation and number input.
	Keys pressed simultaneously	When two keys are to be pressed simultaneously, the keys are shown with a "+" sign between them, ex. [SHIFT]+[COORD]
	Displays	The menu displayed in the programming pendant is denoted with { }. ex. {JOB}

Description of the Operation Procedure

In the explanation of the operation procedure, the expression "Select . . ." means that the cursor is moved to the object item and the SELECT key is pressed, or that the item is directly selected by touching the screen.

Registered Trademark

In this manual, names of companies, corporations, or products are trademarks, registered trademarks, or brand names for each company or corporation. The indications of (R) and TM are omitted.

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4 FTP Settings

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1 Outline

The NX100 provides the FTP function, an extended application of the data transmission function (Ethernet), as a server or a client.

This manual explains the operation methods and relevant information of FTP.



The FTP function is enabled with the NS3.00.00A(*)-00 and the versions thereafter. It does not work on the versions older than the NS3.00.00A(*)-00.

1.1 System Features

1.1.1 FTP Function

FTP (File Transfer Protocol) is a widely used protocol in transferring files over the Internet or Intranet. This protocol enables the FTP function in the NX100, allowing the transfers of the following files:

- Job data
- Condition data/General data
- System information

1.1.2 Files Transferred by FTP Function

Details on the files which are transferred by FTP function are explained in the following table.

Data Category	Procedure	Subject File
Job	Load	Jobs (Can be transferred in either of the SINGLE JOB mode or RELATED JOB mode.)
	Save	
Condition Data/General Data	Load	<ul style="list-style-type: none"> • Tool data • Weaving data • User coordinate data • Welding data • Variable data
	Save	
System Information	Save	<ul style="list-style-type: none"> • System information • Alarm history

2 FTP Server Function

2.1 Outline

The NX100 FTP server function is a function which saves NX100 files in the host computer (an operation of the command "get" in FTP) or loads files of the host computer to the NX100 (an operation of the command "put" in FTP) via Ethernet, enabled by operating the host computer such as a personal computer.

This function can handle the processing equivalent to the file data transmission function of the host control function in an NX100 data transmission.

2.2 Settings

2.2.1 Setting up FTP

Perform the operations described in "4 FTP Settings".

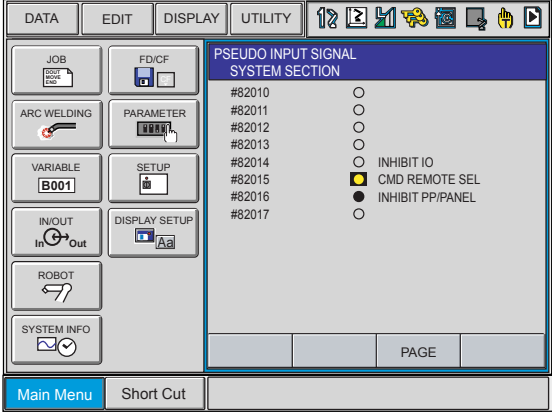
2.2.2 Command Remote Setting

Perform the following procedures to enable the command remote selection.



Set the command remote selection status in the management mode.

	Operation	Explanation
1	Select {IN/OUT} under the {Main Menu}.	
2	Select {PSEUDO INPUT SIGNAL}.	

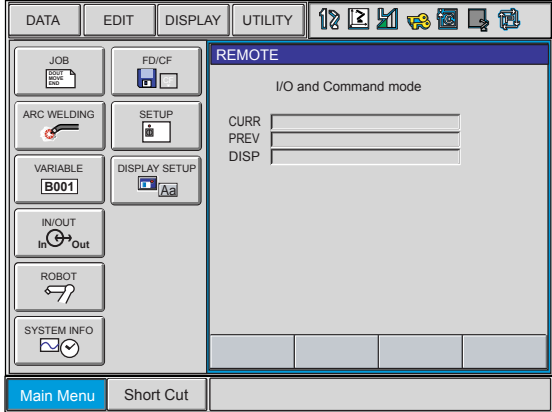
	Operation	Explanation
3	Move the cursor to "CMD REMOTE SEL", and press [INTERLOCK]+[SELECT].	<p>The command remote selection is enabled when the status is switched to "●". The FTP function is disabled when the "CMD REMOTE SEL" status is "○".</p> 

2.2.3 REMOTE Mode Setting

Set the mode switch on the programming pendant to [REMOTE].

2.2.4 Checking the Command Remote Setting

Check that the indication of "Command mode" or "I/O and Command mode" appears on the display of the remote mode.

	Operation	Explanation
1	Select {IN/OUT} under the {Main Menu}.	
2	Select {REMOTE}.	<p>The current mode status appears.</p>  <p>The FTP server function is disabled when "Remote mode not specified" or "I/O mode" is indicated on the window.</p>

2.3 Host Computer Operations

2.3 Host Computer Operations

Refer to the example below showing the process of receiving jobs in case of using Windows 2000 command prompt. Note that the underlined parts are the input items: enter the commands with the host computer, and press [Enter] after typing each command.

```

C:\>ftp 192.168.1.55 . . . *1
Connected to 192.168.1.55
220 NX FTP server ( 0.06) ready.
User (192.168.1.65:(none)): ftp . . . *2
331 Password required for ftp.
Password:            . . . *3
230 User ftp logged in.
ftp> ls . . . *4
200 PORT command successful.
150 Opening ASCII mode data connection. (192,168,1,65,1233)
AA35.JBI
AA4.JBI
AA8.JBI
N.JBI
AA36.JBI
AA5.JBI
AA9.JBI
N1.JBI
AA37.JBI
AA7.JBI
AA6.JBI
226 Transfer complete.
ftp: 99 bytes received in 0.11 Seconds 0.91 Kbytes/sec.
ftp> get AA35.JBI . . . *5
200 PORT command successful.
150 Opening ASCII mode data connection. (192,168,1,65,1234)
226 Transfer complete.
ftp: 121 bytes received in 0.01 Seconds 8.07 Kbytes/sec.
ftp>bye . . . *6
221 Goodbye.

C:\>

```

- *1** Command to connect to the NX100 (FTP server) for FTP transmissions.
- *2** Enter a user name to login to the NX100.
- *3** Enter a password corresponding to the user name.
- *4** Command to fetch the file list of the NX100.
- *5** Command to fetch the jobs from the NX100.
- *6** Command to exit FTP transmissions.

2.4 FTP Accounts

Use the following user names and passwords to access the NX100 with FTP server function.

User Name	Password	Processing
nxmaster	Password for management mode	Loading/saving jobs Loading/saving condition data/general data Saving system information Saving parameters
ftp	Arbitrary password	Loading/saving jobs Loading/saving condition data/general data Saving system information
anonymous	Arbitrary password	Saving jobs Saving condition data/general data

2.5 FTP Commands

The following commands can be used with FTP server function.

Classification	User Command	FTP Command	Explanation
CONNECTION	open <i>IP address</i>	-	Connects to a remote NX100.
	user <i>username</i>	USER <i>username</i>	Enter a user name to access the NX100.
	-	PASS <i>password</i>	Enter a password corresponding to the user name. (Usually the client will automatically request for a password entry after an user name entry.)
	quit	QUIT	Terminates an FTP transmissions.
	bye	QUIT	Terminates an FTP transmissions.
FILE TRANSMISSION	-	PORT	Specifies a control connection port. (The client will automatically send to the NX100.)
	get <i>filename</i>	RETR <i>filename</i>	Receives a file from a remote NX100.
	put <i>filename</i>	STOR <i>filename</i>	Sends a file to a remote NX100.
FILE LIST	ls (<i>filename</i>)	NLST (<i>filename</i>)	Fetches a file list of the NX100. When no extension is specified, the file list of jobs will be displayed. When an extension such as "*.dat" or "*.cnd" is specified, the corresponding file list will be displayed.

2.6 Precautions on the "ls" Command

2.6.1 Inhibition of Using the Command Option

NOTE Use the "ls" command with no options.

The information on the time stamp, attributes, and size of the file output by the command "ls -l" ("NLST -l" for FTP command) or "dir" ("LIST" for FTP command) is provided only for the compatibility of the output format, and is not correct.

In order to prevent any mistake, be sure to use the "ls" for the list command.

2.6.2 Condition Data/General Data Files

NOTE Confirm that the corresponding files exist in the NX100 memory before transferring condition data/general data files.

The file lists from the pre-defined table of lists on NX100 transmission system are output by the "ls *.dat" or "ls *.cnd" command. All of the displayed files may not actually exist in the NX100 memory. Attempting to load/save a file which does not exist in the NX100 causes the alarm "TRANSMISSION SYSTEM ERROR" and disconnects FTP connections.

2.7 Restrictions on File Transfer

2.7.1 Inhibition of Transferring the Files Size "0"

NOTE Do not transfer a file of which size is "0".
If the file is transferred (PUT), the alarm "TRANSMISSION SYSTEM ERROR" occurs, resulting in an FTP disconnection.

2.7.2 Interruption of Transmission

NOTE Do not interrupt the transmission with an operation [Ctrl] + [C].
The transmission interruption executed with [Ctrl] + [C] operation may result in a failure to maintain the correct transmission.

3 FTP Client Function

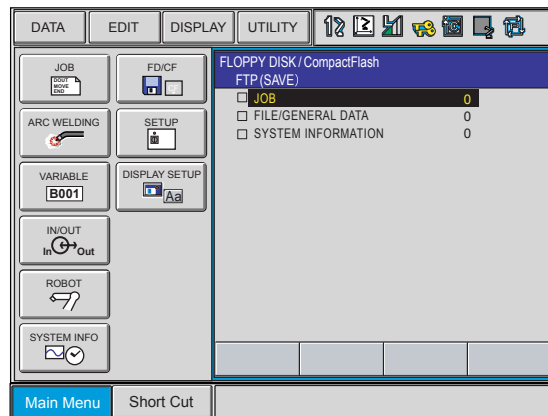
3.1 Outline

The NX100 FTP client function is a function which saves NX100 files in the host computer (an operation of the command "put" in FTP) or loads files of the host computer to the NX100 (an operation of the command "get" in FTP) via Ethernet, enabled by operating the NX100. It allows to load/save files which correspond to security mode.

The function executes the processing equivalent to the stand-alone function of an NX100 data transmissions.

The NX100 FTP client function is executed with {FD/CF} under the {Main Menu}. As shown in the window below, there are 3 groups of data which can be saved with this function: while the other devices (such as FC1, FC2, Compact Flash) can handle 8 groups of data, the FTP client function handles 3 of them.

As to the contents of each group and names of saved files, refer to "8.1 External Memory Devices" in "NX100 OPERATOR'S MANUAL".



3.2 Settings

3.2.1 Setting up FTP

Perform the operations described in "4 FTP Settings".

3.2.2 Disabling the Read-only Function of the Host Control

Set the parameter RS005 to "0".

Set the mode switch on the programming pendant to [PLAY] or [TEACH] once, then set it to [REMOTE].

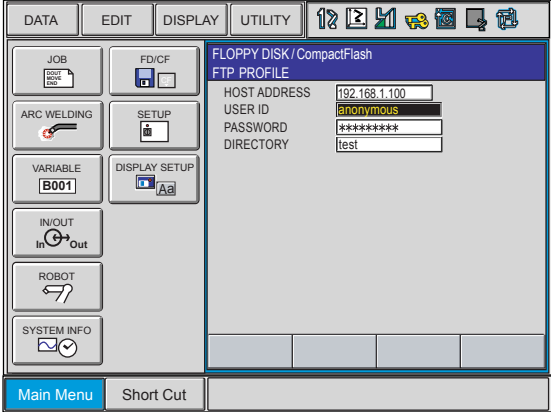
3.2.3 Cancelling the Remote Mode

Set the mode switch on the programming pendant to [TEACH].

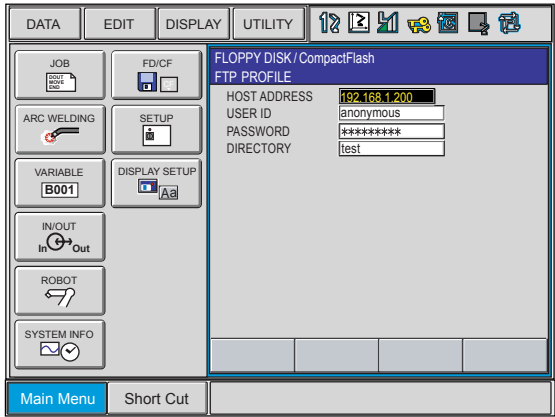
3.3 Operations

3.3.1 Setting the FTP Profile

Perform the following procedures to set up the FTP profile, such as an IP address, etc. of an FTP server.

	Operation	Explanation
1	Select {FD/CF} under the {Main Menu}.	
2	Select {FTP PROFILE}.	<p>The FTP PROFILE window appears.</p>  <p>The screenshot shows a software interface with a menu on the left and a main window on the right. The menu includes options like JOB, ARC WELDING, VARIABLE, IN/OUT, ROBOT, and SYSTEM INFO. The main window is titled 'FLOPPY DISK / CompactFlash' and contains an 'FTP PROFILE' section with the following fields: HOST ADDRESS (192.168.1.100), USER ID (anonymous), PASSWORD (*****), and DIRECTORY (test). At the bottom of the interface, there are 'Main Menu' and 'Short Cut' buttons.</p> <p>HOST ADDRESS IP address of the FTP server to be connected.</p> <p>USER ID User ID to login to the FTP server.</p> <p>PASSWORD Password corresponding to the user ID.</p> <p>DIRECTORY Default directory to login to the FTP server.</p>

3.3 Operations

	Operation	Explanation
3	Select an item to be changed.	The selected box is in an input status.
4	Enter new information for FTP connection.	New condition for FTP connection has been specified. 

3.3.2 Selecting FTP as a Transmission Device

Perform the following procedures to select an FTP client as an external memory device.

	Operation	Explanation
1	Select {FD/CF} under the {Main Menu}.	
2	Select {DEVICE}.	The DEVICE selection window appears.
3	Select "FTP" from the selection list.	The FTP client has been selected as an external memory device.

3.3.3 SAVE

Perform the following procedures to transfer data from the NX100 to the FTP server (the host computer).

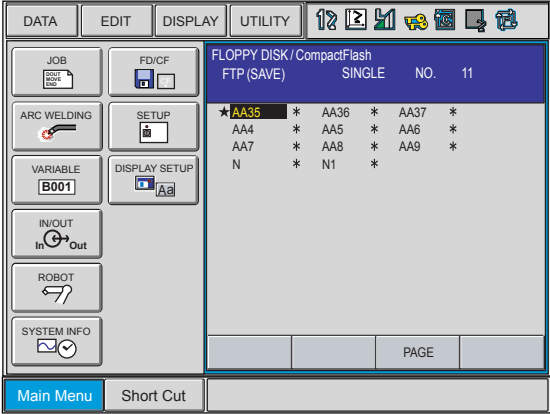
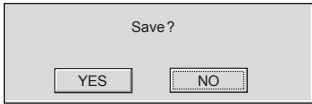
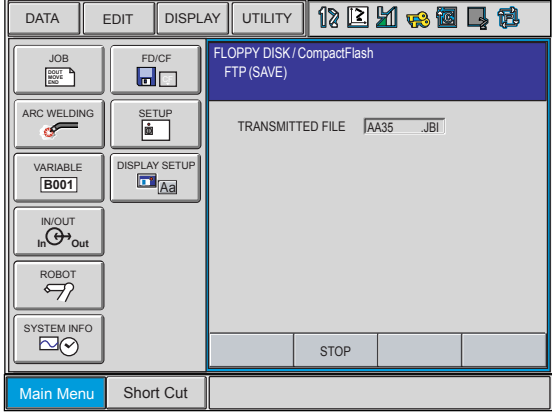


If the job/file to be saved has the same name as a job/file already exists in the FTP server, the existing job/file will be overwritten with the new data. To keep the existing data in the FTP server as they are, take the necessary precautions such as changing the job/file name to prevent overwriting.

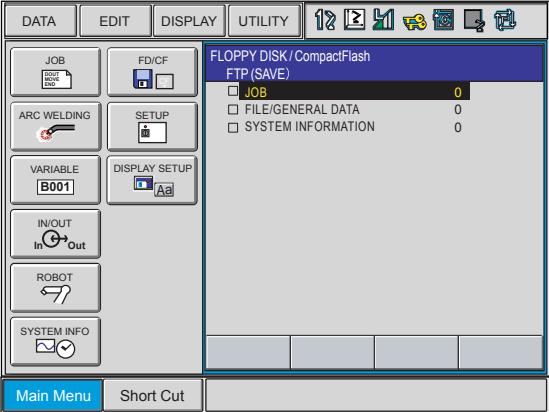
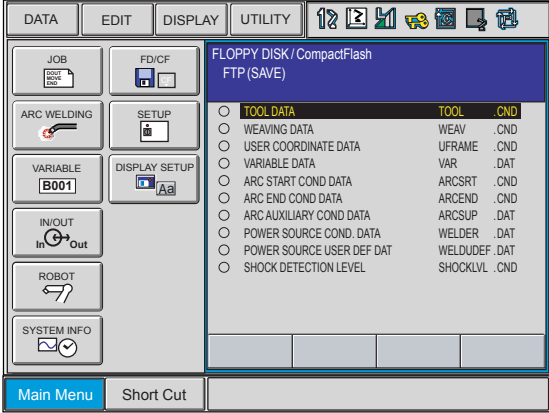
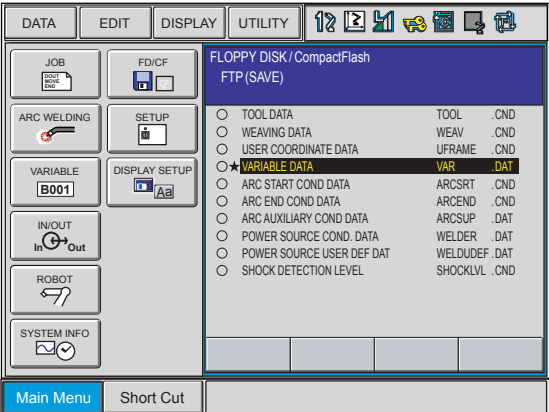
■ Saving Jobs

	Operation	Explanation
1	Select {FD/CF} under the {Main Menu}.	
2	Select {SAVE}.	<p>The FTP(SAVE) window appears.</p>
3	Select "JOB".	<p>A job list appears.</p>

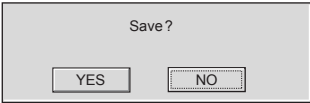
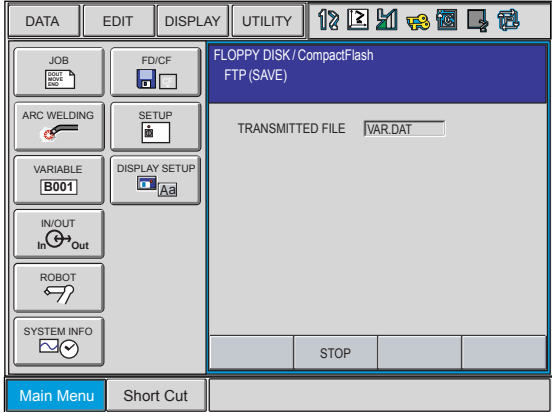
3.3 Operations

	Operation	Explanation
4	Select jobs to be saved.	<p>Each selected job is marked with “★”.</p> 
5	Press [ENTER].	<p>A confirmation dialog box appears.</p> 
6	Select {YES}.	<p>Saving of the selected jobs starts, and the transmission progress appears on the window.</p> 

■ Saving Files

	Operation	Explanation
1	Select {FD/CF} under the {Main Menu}.	
2	Select {SAVE}.	<p>The FTP(SAVE) window appears.</p>  <p>The screenshot shows the 'FTP(SAVE)' window with a menu on the left containing options like JOB, ARC WELDING, VARIABLE, IN/OUT, ROBOT, and SYSTEM INFO. The main area displays a list of data types with checkboxes: JOB (checked), FILE/GENERAL DATA, and SYSTEM INFORMATION.</p>
3	Select "FILE/GENERAL DATA" or "SYSTEM INFORMATION".	<p>A selection window appears.</p>  <p>The screenshot shows the 'FTP(SAVE)' window with a list of data types and radio buttons: TOOL DATA (selected), WEAVING DATA, USER COORDINATE DATA, VARIABLE DATA, ARC START COND DATA, ARC END COND DATA, ARC AUXILIARY COND DATA, POWER SOURCE COND. DATA, POWER SOURCE USER DEF DAT, and SHOCK DETECTION LEVEL.</p>
4	Select files to be saved.	<p>Each selected file is marked with "★".</p>  <p>The screenshot shows the 'FTP(SAVE)' window with a list of data types and radio buttons. The 'VARIABLE DATA' entry is selected and marked with a star (★).</p>

3.3 Operations

	Operation	Explanation
5	Press [ENTER].	<p>A confirmation dialog box appears.</p> 
6	Select {YES}.	<p>Saving of the selected files starts, and the transmission progress appears on the window.</p> 

3.3.4 LOAD

Perform the following procedures to transfer data from the FTP server (the host computer) to the NX100.

The display windows in this procedures are omitted, as they are equivalent to the windows in the saving procedures.

■ Loading Jobs

	Operation	Explanation
1	Select {FD/CF} under the {Main Menu}.	
2	Select {LOAD}.	The FTP(LOAD) window appears.
3	Select "JOB".	A job list appears.
4	Select jobs to be loaded.	Each selected job is marked with "★".
5	Press [ENTER].	A confirmation dialog box appears.
6	Select {YES}.	Loading of the selected jobs starts, and the transmission progress appears on the window.

■ Loading Files

	Operation	Explanation
1	Select {FD/CF} under the {Main Menu}.	
2	Select {LOAD}.	The FTP(LOAD) window appears.
3	Select "FILE/GENERAL DATA" or "SYSTEM INFORMATION".	A selection window appears.
4	Select files to be loaded.	Each selected file is marked with "★".
5	Press [ENTER].	A confirmation dialog box appears.
6	Select {YES}.	Loading of the selected files starts, and the transmission progress appears on the window.

3.3 Operations

3.3.5 VERIFY

Perform the following procedures to verify that the data in the NX100 and the data in the FTP server (the host computer) are the same. The unmatched data will be notified with a message.

The display windows in this procedures are omitted, as they are equivalent to the windows in the saving procedures.

■ **Verifying Jobs**

	Operation	Explanation
1	Select {FD/CF} under the {Main Menu}.	
2	Select {VERIFY}.	The FTP(VERIFY) window appears.
3	Select "JOB".	A job list appears.
4	Select jobs to be verified.	Each selected job is marked with "★".
5	Press [ENTER].	A confirmation dialog box appears.
6	Select {YES}.	Verification of the selected jobs starts, and the transmission progress appears on the window.

■ **Verifying Files**

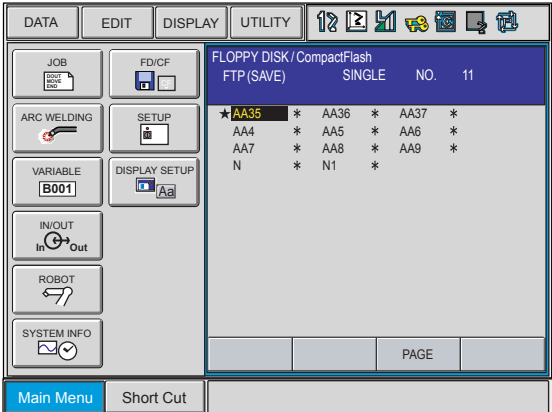
	Operation	Explanation
1	Select {FD/CF} under the {Main Menu}.	
2	Select {VERIFY}.	The FTP(VERIFY) window appears.
3	Select "FILE/GENERAL DATA" or "SYSTEM INFORMATION".	A selection window appears.
4	Select files to be verified.	Each selected file is marked with "★".
5	Press [ENTER].	A confirmation dialog box appears.
6	Select {YES}.	Verification of the selected files starts, and the transmission progress appears on the window.

3.3.6 Selection Mode

The jobs and data files to be loaded, saved, or verified can be selected in either of the following modes:

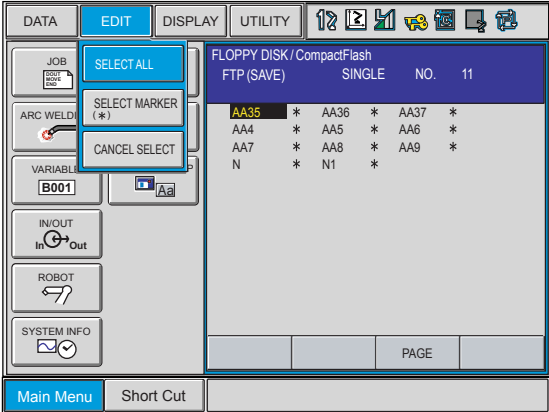
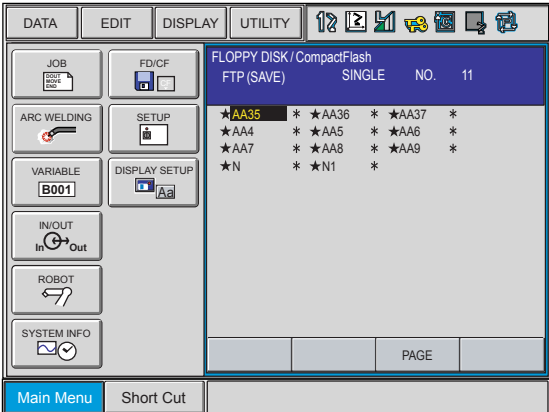
- Individual Selection Mode
Jobs or data files are selected one by one.
- Batch Selection Mode
Jobs or data files are selected collectively at a time.

■ Individual Selection Mode

	Operation	Explanation
1	Select {FD/CF} under the {Main Menu}, and select jobs/files for desired operation in a job list/selection window.	<p>Jobs/files are selected. Each selected job/file is marked with “★”.</p> 

3.3 Operations

■ Batch Selection Mode

	Operation	Explanation
1	Select {FD/CF} under the {Main Menu}, and select {EDIT} when a job list/selection window is on the screen.	<p>A pull-down menu appears.</p> 
2	Select {SELECT ALL}.	<p>All the listed jobs/files are selected.</p>  <p>* Select {EDIT}, then {CANCEL SELECT} to cancel all the selected jobs/files at a time.</p>

4 FTP Settings

Perform the following settings for both the FTP server and the FTP client to enable the FTP function.

4.1 Ethernet Function Setting

The FTP function is designed as an extended application of the Ethernet function. Therefore, it is required to enable the Ethernet function before using the FTP function.

Refer to “3 Ethernet Function Setting” in “NX100 OPTIONS INSTRUCTIONS FOR ETHERNET FUNCTION” for the details.

4.2 Parameters for the FTP Function

Enable the FTP function parameters.

(Contact your Yaskawa representative in case of changing these parameters.)

4.3 Transmission Parameter Setting

The parameters related with transmissions are listed in the following tables.

Refer to the “NX100 OPTIONS INSTRUCTIONS FOR DATA TRANSMISSION FUNCTION” for the details.

Be sure to change the value of the following parameter:

Parameter No.	Contents	Setting Value	Initial Value
RS000	Specifies the protocol for the standard port.	2 (BSC)	3 (FC1)

Set the following parameters to their initial values.

Parameter No.	Contents	Initial Value
RS029	Loading of job/variable during playback	1: Enable
RS030	Specifies the data bits.	8: 8 bits
RS031	Specifies the stop bits.	0: 1 bit

Parameter No.	Contents	Initial Value
RS032	Specifies the parity.	2: Even parity
RS033	Specifies the baud rate.	7: 9600 bauds
RS036	Specifies the enquiry character retry count for invalid responses or nonresponses.	10: 10 (counts)
RS037	Specifies the text data transmission retry count for block check error (NAK reception).	3: 3 (counts)
RS038	Specifies the block check method.	0: Checksum

Adjust the following parameters to stabilize the FTP transmissions as required.

Parameter No.	Contents	Recommended Setting for FTP	Initial Value
RS034	TIMER A: Timer for monitoring the sequence. Controls the response waiting time for the invalid responses or nonresponses. Units: 0.1 sec (setting range: 0 to 100)	100	30
RS035	TIMER B: Timer for monitoring text reception. Controls the monitoring time to wait for the text termination character. Units: 0.1 sec (setting range: 0 to 255)	200	200

NX100 OPTIONS INSTRUCTIONS

FOR FTP FUNCTION

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