

Using File Transfer Protocol (FTP) with Yaskawa Controllers

Introduction

You can send or retrieve individual files from our controllers using the File Transfer (FTP) protocol. FTP is available on virtually all computers. This document will provide documentation and some tips on using FTP with Yaskawa Motoman controllers.

Connecting the Robot to a Network

Most of our systems support multiple Ethernet LAN connections to the controller. Connections are labelled LAN1, LAN2, and LAN3. LAN1 is reserved to be used by the pendant. LAN 2 and LAN3 connections can be configured in Maintenance Mode (System, Option Function, LAN Interface Settings). Reference material explaining the network capabilities and configuration instructions is included in the “References” section below.

You will need to coordinate the network settings for the controller with all other devices on same the network so they can communicate with each other. If this is a new network, the following settings are commonly used and will get you started:

IP ADDRESS: 192.168.1.31 (for the controller)

SUBNET MASK: 255.255.255.0

If your PC will be connecting on the same network use similar settings for your PC but pick something other than 31 for the last part of the IP Address. Every device on the same network subnet (e.g., 192.168.1.*) must have a unique number in the last part of the IP Address.

You can have multiple robot controllers on the same network and access any / all of them from other devices on the network. Make sure each has a unique address.

References – LAN Interface Settings

Controller	Manual Name / Link
DX100	Ethernet Function

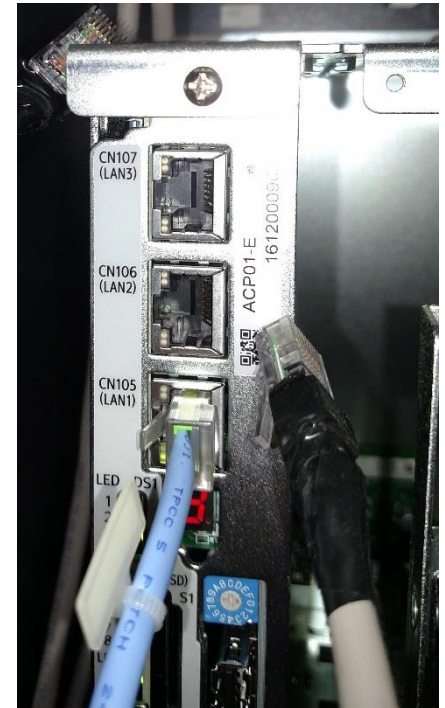


Figure 1 - Lan connections on a YRC1000

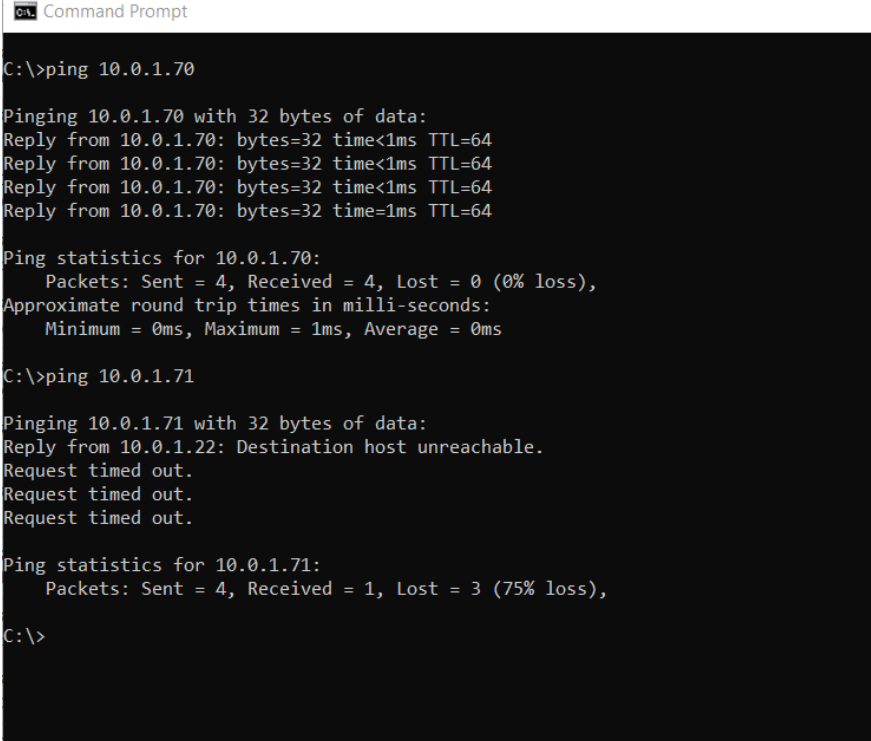
This document captures ideas, experiences, and informal recommendations from the Yaskawa Partner Support team. It is meant to augment – not supersede manuals or documentation from motoman.com. Please contact the Partner Support team at partnersupport@motoman.com for updates or clarification.

Controller	Manual Name / Link
DX200	Ethernet Function
FS100, FS100L	Controller Operator's
YRC1000	General Operator's
YRC1000micro	YRC1000micro Operator's Manual

Testing the Network Connection

To verify the correct network settings are in place, there is a “ping” function available on most networked systems. (The name comes from submarine active sonar terminology that sends a pulse of sound and listens for the echo to detect objects under water.) A device can send a “ping” network packet targeting other devices on the network and listen to see if there is a response and how long it takes to return.

To issue a ping from your Windows PC, open a command prompt (click on “Start,” type CMD and then press enter.) From the command prompt, enter “ping 192.168.1.31” (or the address of your controller that you entered). A successful response will begin with “Reply from “. Unsuccessful responses are “Request timed out.”



```
Command Prompt
C:\>ping 10.0.1.70

Pinging 10.0.1.70 with 32 bytes of data:
Reply from 10.0.1.70: bytes=32 time<1ms TTL=64
Reply from 10.0.1.70: bytes=32 time<1ms TTL=64
Reply from 10.0.1.70: bytes=32 time<1ms TTL=64
Reply from 10.0.1.70: bytes=32 time=1ms TTL=64

Ping statistics for 10.0.1.70:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\>ping 10.0.1.71

Pinging 10.0.1.71 with 32 bytes of data:
Reply from 10.0.1.22: Destination host unreachable.
Request timed out.
Request timed out.
Request timed out.

Ping statistics for 10.0.1.71:
    Packets: Sent = 4, Received = 1, Lost = 3 (75% loss),

C:\>
```

Figure 2 - Ping from PC

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You can also issue a ping from DX200 or YRC controllers to other devices on the network to check connectivity “outwards” from the controller. The ping command is available under SYSTEM INFO, NETWORK UTILITY if you are at Management Level security. Operation is like on a PC. You provide the target network address and select “EXECUTE” from the bottom of the screen to start the ping. Results will be displayed on the pendant.

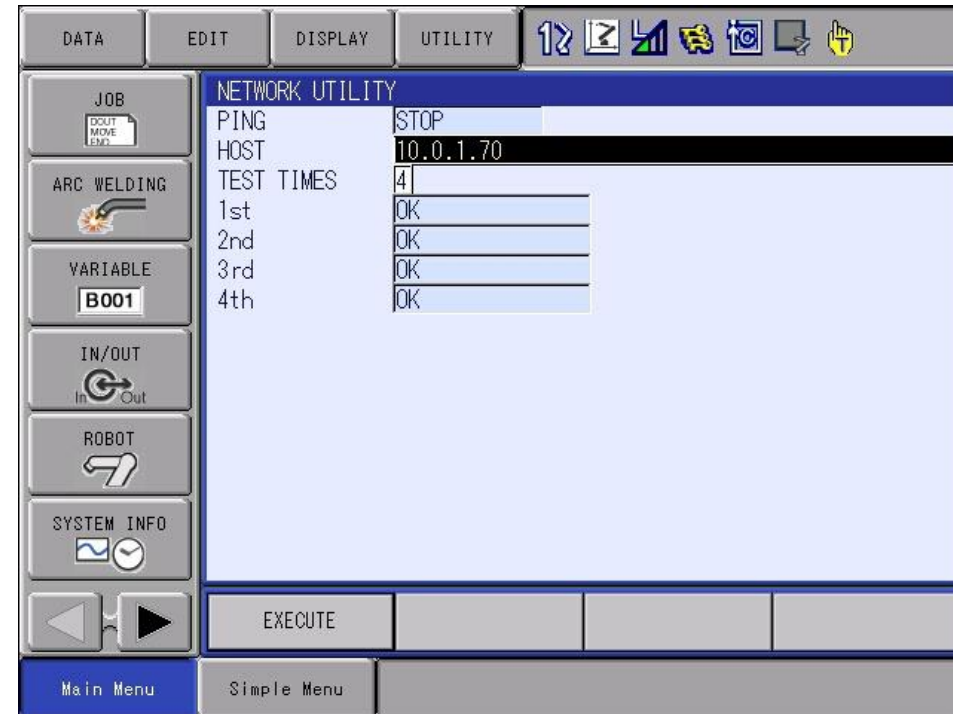


Figure 3 - Ping from Controller

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Using FTP

File Transfer Protocol (FTP) is another standard (free) TCP/IP function like ping. It is used to send or receive files from one device to another via the network. In operation, one device is an FTP “Client” which makes requests of a device acting as the FTP “Server” where the files are located. Clients send commands that servers respond to. The client can receive files from the server, send files to the server, request a directory of available files and issue other commands. Our controllers can function as an FTP server. There is an FTP client application that is included with Windows. It runs from the Windows command line. There are also numerous freeware or public domain clients for Windows that can be downloaded. These may be easier to use and configure than the native Windows FTP client. Shown, is an FTP session using the “FileZilla” Windows app.

The FTP Server functions are available on FS100, DX100, DX200 and YRC controllers. Exact features and setup of the server varies slightly. A list of reference documents for enabling FTP on these controllers follows. TIP: Read and follow instructions carefully. Experience has shown it can be tricky to get FTP transfers working with different settings.

References – File Transfer Protocol (FTP)

Controller	Manual Name / Link
DX100	FTP Function
DX200	FTP Function (Ethernet Advanced Feature Function)
FS100	FTP Function
YRC1000	Ethernet Function
YRC1000micro	Ethernet Function

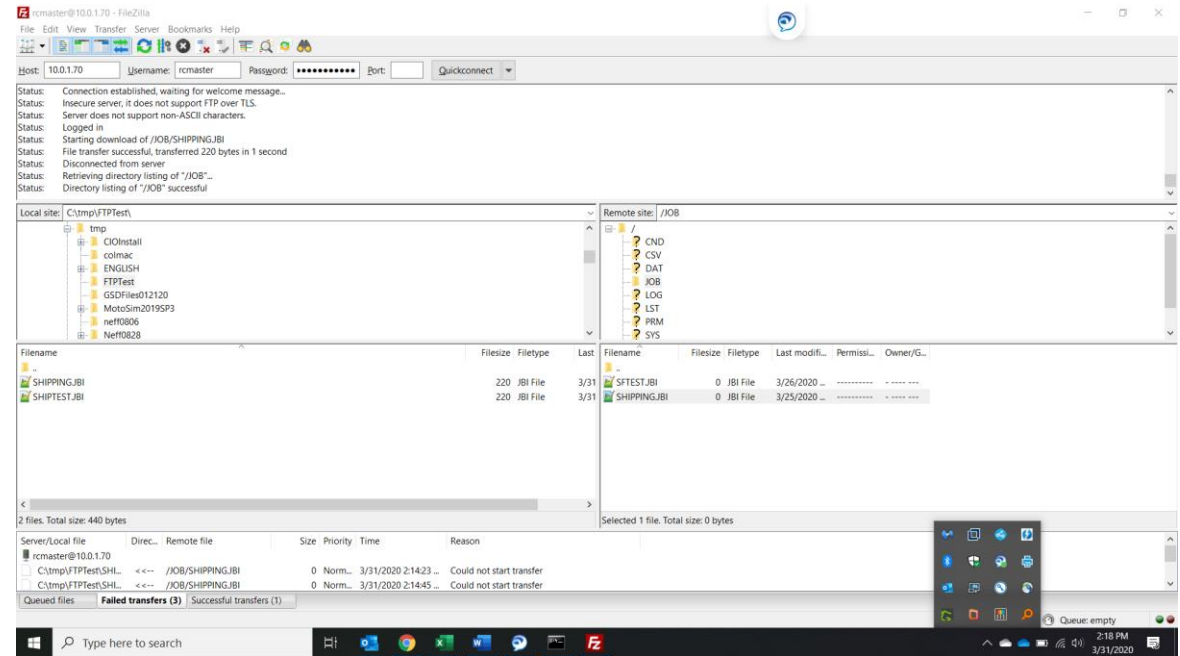


Figure 4 - FileZilla FTP Session

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Tips for Using FTP

In maintenance mode, be sure to check your Network Function settings. There, we recommend FTP be set to STANDARD - not EXPAND to turn off SSL/TLS. Below is a description of the operation of the FTP server in STANDARD vs. EXPAND mode.

Division	Details	DX200	YRC1000	
			Standard	Expand
Unencrypted communication	Plain text communication	○	○	×
Encrypted communication	SSL/TLS encrypted communication	×	×	○
Login name	'rcmaster'	○	○	○
	'ftp'	○	○	×
	'anonymous'	○	○	×
Command support	'ls' (list display)	Job list output * Other than the job, an extension must be specified.	File/folder list output * If an extension is not specified, a list of all files and folders are output.	
	'cd' (change directory)	×	○	
	'b' (binary transmission)	○	○	
	'a' (ASCII transmission) * Responds OK to the ASCII transmission command, but it is not applied.	×	×	
Data configuration	Data saved to the login directory * Changes can be made by the parameter.	Internal data	Data folder ▪ JBI ▪ DAT ▪ CND Others	

X = Feature NOT available

○ = Feature IS available

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On your FTP client, use **rcmaster** as the username and then your MANAGEMENT password to connect to the controller. (See the list of valid usernames below.) Once you verify you can transfer files using rcmaster, you can verify other usernames.

User name	Password	Processes that can be executed
'rcmaster'	Management mode password	<ul style="list-style-type: none">▪ Saving / Loading a job▪ Saving / Loading a condition file or general data▪ Saving the system data▪ Saving the parameters▪ Backing up batch data
'ftp' * Only in the standard mode	Any password	<ul style="list-style-type: none">▪ Saving / Loading a job▪ Saving / Loading a condition file or general data▪ Saving the system data▪ Backing up batch data
'anonymous' * Only in the standard mode	Any password	<ul style="list-style-type: none">▪ Saving / Loading a job▪ Saving a condition file or general data

We have found third-party FTP clients (e.g., FILEZILLA) are easier to set up and more reliable ways to get connected than just a windows FTP command. Both can work, but you get more features out of the third-party clients.

RS089 set to 1 to allow FTP directory view (if no files or only job files visible)