



Revision History

Revision	Date	Details
A	8/8/17	Document creation
B	8/10/17	Added remote control information
C	7/15/19	Revision for bit limitation in RC+ 7.X



How to Connect an Epson Controller to an Ethernet/IP Master PLC

Abstract

This document shows how to connect an Epson robot controller as a generic Ethernet/IP slave module to an Ethernet/IP master programmable logic controller (PLC). Epson provides an electronic data sheet (EDS) file for the Ethernet/IP slave card. If the supplied EDS file is not establishing connection to the PLC, this solution overcomes that issue. Symptoms of an unsuccessful slave configuration include the inability to send or receive data from the slave card to the PLC. This solution applies to the following controllers: RC90, RC180, RC620+, RC700, RC700-A.

Solution

The robot controller has an optional board for Ethernet/IP. Each controller has a different installation guide for an Ethernet/IP board slave board. For RC+ 5.X, refer to the controller manual for information on how to install an option board. For version after RC+ 5.X, refer to the fieldbus IO manual for information on option board installment.

To connect an Epson controller as a generic Ethernet/IP module enter the following parameters in your programmable logic device (PLC). This table assumes an input and output size of 256 bits.

a) Comm Format: Data - INT		
	Assembly Instance:	Size:
Input:	100	16
Output:	150	16
Configuration:	1	0

b) Comm Format: Data - SINT		
	Assembly Instance:	Size:
Input:	100	32
Output:	150	32
Configuration:	1	0

c) Comm Format: Data - DINT		
	Assembly Instance:	Size:
Input:	100	8
Output:	150	8
Configuration:	1	0

Figure 1 Ethernet/IP Connection Parameters

Changing the data type will determine the assembly instance and size. RC+ 5.X and 6.X controllers are limited to 256 bits or 32 bytes. RC+ 7.X controllers are limited to 2048 bits or 256 bytes. The formula for configuration size (S) is controller input or output size (cs) divided by memory bits (b):

$$S = cs/b$$

SINT = 8 memory bits

INT = 16 memory bits

DINT = 32 memory bits

The PLC Master outputs directly map to the Slave inputs and vice versa. There is no special register addressing on the PLC side. Fieldbus I/O PLC bit #1 goes to the Epson controller bit #512 and PLC bit #256 corresponds to bit #767 on the robot controller side. In Epson robot controllers standard and expansion discrete I/O occupy bits 0 to 191.

To verify the slave device configuration on the PLC open the EPSON RC+ I/O Monitor. Double click on the fieldbus output bits to force them on/off. You should see the corresponding bit toggle on the PLC side. Similarly, force the PLC Ethernet IP outputs on and off and verify that the robot controller's Ethernet/IP inputs respond accordingly.

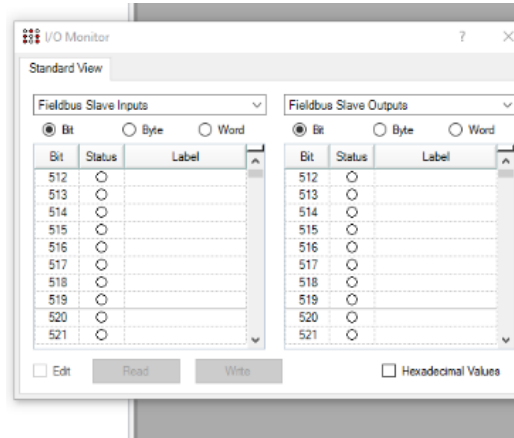


Figure 2 I/O Monitor Window

In Epson RC+, there is no Ethernet/IP address mapping. The input and output bits are user configurable. To find instructions on how to configure remote control functionality please refer to the Epson RC+ user's guide for the software version in question. In RC+ 5.X and 6.X, the user's guide remote control information is located in chapter 10. In RC+ 7.X, the user's guide remote control information is located in chapter 11.

