

Field network system with minimal wiring

NETWORK

Applicable controllers ▶ RCX221 RCX222 RCX240

Network modules CC-Link

- Option unit with networking functions that can be incorporated in YAMAHA robot controllers, RCX221 / RCX222 / RCX240.
- As connection of the robot system and the sequencer requires only one (4-wire) dedicated cable, it is possible to save wiring of the entire system, which contributes to efficient wiring work, reduction of installation and maintenance costs, etc.
- 96 general use inputs/outputs, 16 dedicated inputs/outputs (4 nodes occupied).
- Capable of simulating serial operation of parallel I/O. With this function set properly, it is possible to control various I/O units connected to the parallel I/O of the robot controller, such as sensor and relay from the sequencer side without using the robot program, as if they are I/Os of the CC-Link system.

Basic specifications for network modules CC-Link

Item	Network modules CC-Link
Applicable controllers	RCX221 / RCX222 / RCX240
Version supporting CC-Link	Ver. 1.10
Remote station type	Remote device node
Number of occupied stations	Fixed to 4 stations
Station number setting	1 to 61 (set from the Rotary switch on board)
Communication speed setting	10Mbps, 5Mbps, 2.5Mbps, 625Kbps, 156Kbps (set from the Rotary switch on board)
No. of CC-Link I/O ^{Note1}	General input 96 points, General output 96 points, Dedicated input 16 points, Dedicated output 16 points
Parallel external I/O ^{Note2}	A function that simulates serial communication enables individual control of the various points from a master sequencer, regardless of the robot program.
Shortest distance between nodes ^{Note3}	0.2 m or more
Overall length ^{Note3}	100m/10Mbps, 150m/5Mbps, 200m/2.5Mbps, 600m/625Kbps, 1200m/156Kbps
Monitor LED	RUN, ERR, SD, RD

Note 1. Controller I/Os are updated every 10ms.
 Note 2. With RCX 141/142, the exclusive input of the parallel I/O cannot be used other than the interlock input. With RCX221 / 222, the exclusive input of the parallel I/O cannot be used. (The interlock input terminal is located on the SAFETY connector side.)
 Note 3. These values apply when a cable that supports CC-Link Ver.1.10 is used.

Network modules DeviceNet

- Option unit with networking functions that can be incorporated in YAMAHA robot controllers, RCX221 / RCX222 / RC240.
- As connection of the robot system and the sequencer requires only one (5-wire) dedicated cable, it is possible to reduce wiring of the entire system, which contributes to efficient wiring work, reduction of installation and maintenance costs, etc.
- Capable of simulating serial operation of parallel I/O. With this function set properly, it is possible to control various I/O units connected to the parallel I/O of the robot controller, such as sensor and relay from the sequencer side without using the robot program, as if they are I/Os of the DeviceNet system.

Basic specifications for network modules DeviceNet

Item	Network modules DeviceNet	
Applicable controllers	RCX221 / RCX222 / RCX240	
Applicable DeviceNet specifications	Volume 1 Release2.0 / Volume 2 Release2.0	
Device Profile Name	Generic Device (device number 0)	
Number of occupied CH ^{Note1}	Normal: Input/output 24ch each, Compact: Input/output 2ch each	
MAC ID setting	0 to 63	
Transmission speed setting	500Kbps, 250Kbps, 125Kbps (set using DIP switch on board)	
DeviceNet I/O ^{Note2}	Normal	General input 96 points, General output 96 points, Dedicated input 16 points, Dedicated output 16 points
	Compact	General input 16 points, General output 16 points, Dedicated input 16 points, Dedicated output 16 points
Parallel external I/O ^{Note3}	The master module and up to four ports can be controlled regardless of the robot program by using the pseudoserialization function.	
Network length	Overall length ^{Note}	100m/500Kbps, 250m/250Kbps, 500m/125Kbps
	Branch length / Overall branch length	6m max./39m max., 6m max./78m max., 6m max./156m max.
	Monitor LED	MS (Module Status), NS (Network Status)

Note 1. Use the robot parameter to select Normal or Compact. However, with the controllers earlier than Ver.9.08 of RCX221 / 222, this selection is not available and the setting remains the same as Normal.
 Note 2. Controller I/Os are updated every 10ms.
 Note 3. With RCX221 / 222, the exclusive input of the parallel I/O cannot be used. (The interlock input terminal is located on the SAFETY connector side.)
 Note 4. These values apply when a thick cable is used. The distance is less when a fine cable is used or when thick and fine cables are mixed in use.

Network modules Profibus

- Option unit used to connect a YAMAHA robot controllers RCX221 / RCX222 / RCX240 to Profibus.
- Optimum for high speed data communication and complicated communication processing.
- Communication is made available among devices of multiple number of manufacturers.
- Capable of simulating serial operation of parallel I/O. With this function set properly, it is possible to control various I/O units connected to the parallel I/O of the robot controller, such as sensor and relay from the sequencer side without using the robot program, as if they are I/Os of the Profibus system.

Basic specifications for network modules Profibus

Item	Network modules Profibus
Applicable controllers	RCX221 / RCX222 / RCX240
Communication profile	Profibus-DP slave
Number of occupied nodes	1 node
Setting of station address	1 to 99 (set using Rotary switch on board)
Setting of communication speed	9.6Kbps, 19.2Kbps, 93.75Kbps, 187.5Kbps, 500Kbps, 1.5Mbps, 3Mbps, 6Mbps, 12Mbps (automatic recognition)
Profibus I/O ^{Note1}	General input 96 points, General output 96 points, Dedicated input 16 points, Dedicated output 16 points
Parallel external I/O ^{Note2}	The master module and up to four ports can be controlled regardless of the robot program by using the pseudoserialization function.
Overall length	100m/3M 6M 12Mbps, 200m/1.5Mbps, 400m/500Kbps, 1000m/187.5Kbps, 1200m/9.6K 19.2K 93.75Kbps
Monitor LED	RUN, ERR, SD, RD, DATA-EX

Note 1. The shortest I/O update interval of the controller is 10ms but the actual I/O update time varies depending on the update time with the master station.
 Note 2. With RCX221 / 222, the exclusive input of the parallel I/O cannot be used. (The interlock input terminal is located on the SAFETY connector side.)

Network modules Ethernet

- Option unit used to connect a YAMAHA robot controller to Ethernet, which can be incorporated in YAMAHA robot controllers, RCX221 / RCX222 / RCX240. Connection of this unit to the network operation by the TCP/IP protocol with a 10BASE-T cable makes data exchange with a robots easy.
- Capable of making an easy access from the TELNET terminal to the robot controller. As the command system is the same as that by the RS-232C communication, even first-time users can use it easily. (Windows PCs have a built-in TELNET terminal called TELNET.EXE as a standard equipment.)
- With a number of controllers connected in the network, it is possible to perform integrated information control over robots even at a distance from the work site.

Basic specifications for network modules Ethernet

Item	Network modules Ethernet
Applicable controllers	RCX221 / RCX222 / RCX240
Network specification	As specified for Ethernet (IEEE802.3)
Connector specification	RJ-45 connector (8-pole modular connector) 1 port
Baud rate	10Mbps (10BASE-T)
Communication mode	Half Duplex (Half-duplex)
Network protocol	Application layer: TELNET / Transport layer: TCP / IP Network layer: IP, ICMP, ARP / Data link layer: CSMA/CD / Physical layer: 10BASE-T
Number of simultaneous log inputs	1
Setting of IP address, etc.	Set from RPB
Monitor LED	Run, Collision, Link, Transmit, Receive