

Rcon Modbus Specifications

Second Edition ME0413-2B

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19/2 2/4. 2077- Rentin Fam In 4012 - 270.00 1012 - 44.03 1012 - 44.04 1012 - 44.04	Specifications	ch. 2
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IAI Corporation

Please Read Before Use

Thank you for purchasing our product.

This instruction manual explains the handling methods, structure and maintenance of this product, providing the information you need in order to use the product safely.

Before using the product, be sure to read this manual and fully understand the contents explained herein to ensure safe use of the product.

The DVD enclosed with the product contains instruction manuals for IAI products. When using the product, refer to the necessary sections of the applicable instruction manual by printing them out or displaying them on a PC.

After reading the instruction manual, keep it in a convenient place so that whoever is handling the product can refer to it quickly when necessary.

[Important]

- This instruction manual is an original document dedicated for this product.
- This product cannot be used in ways not shown in this instruction manual. IAI shall not be liable for any result whatsoever arising from the use of the product in any other way than what is noted in the manual.
- The information contained in this instruction manual is subject to change without notice for the purpose of product improvement.
- If any issues arise regarding the information contained in this instruction manual, contact our customer center or the nearest sales office.
- Use or reproduction of this instruction manual in full or in part without permission is prohibited.
- The company names, names of products and trademarks of each company shown in the text are registered trademarks.

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Safety Guide

The Safety Guide is intended to permit safe use of the product and thus to prevent risks and property damage.

Be sure to read it before handling the product.

Safety Precautions for Our Products

Common safety precautions for the use of robots in various operations are indicated here.

No.	Operation	Precautions
1	Model	• This product is not intended or designed for applications where high levels of
	Selection	safety are required, and so cannot guarantee that human lives will be
		protected. Accordingly, do not use it in any of the following applications.
		(1) Medical equipment used to maintain, control or otherwise affect human life or physical health
		(2) Mechanisms or machinery designed for the purpose of moving or
		transporting people (vehicles, railway facilities, aviation facilities etc.)
		(3) Machinery components essential for safety (safety devices etc.)
		• Do not use the product outside the range of the specifications. Otherwise, the
		product life may be drastically shortened, and product damage or facilities
		stoppage may occur.
		 Do not use it in any of the following environments.
		(1) Locations with flammable gases, ignitable objects or explosives
		(2) Locations with potential exposure to radiation
		(3) Locations with ambient temperature or relative humidity exceeding the specifications range
		(4) Locations where radiant heat is applied by direct sunlight or other large heat source
		(5) Locations where condensation occurs due to abrupt temperature changes
		(6) Locations with corrosive gases (sulfuric acid, hydrochloric acid etc.)
		(7) Locations exposed to significant amounts of dust, salt or iron powder
		(8) Locations subject to direct vibration or impact
		• For an actuator used in vertical orientation, select a model with brake. If a
		model without brake is selected, the moving parts may fall when the power is
		turned OFF, causing accidents such as injury or workpiece damage.

No.	Operation	Precautions		
2	Transportation	 When transporting heavy objects, do the work with two or more persons or 		
		utilize equipment such as a crane.		
		 When working with two or more persons, make it clear who is to be in charge 		
		and communicate well with each other to ensure safety.		
		 During transportation, carefully consider the carrying positions, weight, and 		
		weight balance, and be careful to avoid collisions or dropping.		
		 Use appropriate transportation measures for transport. 		
		The actuators available for transportation with a crane have eyebolts attached		
		or tapped holes to mount bolts. Follow the instructions in the instruction		
		manual for each model.		
		Do not climb onto the package.		
		• Do not put anything heavy that could deform the package on it.		
		 When using a crane with capacity of 1t or more, have an operator qualified for crane operation and sling work. 		
		• When using a crane or equivalent equipment, make sure not to suspend loads		
		exceeding the equipment's rated load.		
		Use a hook that is suitable for the load. Consider the safety factor of the hook		
		in such factors as shear strength. Also, check to make sure that the hook is		
		free of damage.		
		 Do not climb on loads suspended from cranes. 		
		 Do not leave loads suspended from cranes for long periods. 		
		 Do not stand under loads suspended from cranes. 		
3	Storage and	• For the storage and preservation environment, see the installation		
	Preservation	environment. However, give especial consideration to the prevention of		
		condensation.		
		 Store the products so as to prevent them from falling over or down in the case 		
4	lu stallation	of natural disasters such as earthquakes.		
4	Installation	(1) Installation of robot body and controller, etc.		
	and Startup	Be sure to securely hold and fix the product (including the workpiece). If the meduat falls every is drapped, or exercise chapter ally, it may lead to demonst		
		product fails over, is dropped, or operates abnormality, it may lead to damage		
		Also, be equipped for falls over or down due to natural disasters such as		
		earthquakes.		
		 Do not climb on or put anything on the product. Otherwise, this may lead to 		
		accidental falling, injury or damage to the product due to falling objects,		
		product loss of function or performance degradation, or shortening of product		
		life.		
		• When using the product in any of the places specified below, provide sufficient		
		shielding.		
		(1) Locations where electrical noise is generated		
		(2) Locations with strong electrical or magnetic fields		
		(3) Locations with mains or power lines passing nearby		
		(4) Locations where the product may come in contact with water, oil or		
		chemical spray		

No.	Operation	Precautions		
4	Installation	(2) Cable wiring		
	and Startup	• Use IAI genuine cables for connecting the actuator and controller, and for the		
		teaching tools.		
		• Do not scratch cables, bend them forcibly, pull them, coil them, snag them, or place heavy objects on them. Otherwise, this may lead to fire, electric shock, or abnormal operation due to leakage or conduction malfunction.		
		 Perform the wiring for the product after turning OFF the power to the unit, and avoid miswiring. 		
		• When wiring DC power (+24V), be careful with the positive/negative polarity. Incorrect connections may lead to fire, product breakdown or abnormal operation.		
		• Connect the cable connector securely so that there is no disconnection or looseness. Otherwise, this may lead to fire, electric shock, or abnormal operation of the product.		
		• Never cut or reconnect the cables supplied with the product for the purpose of extending or shortening the cable length. Otherwise, this may lead to fire or abnormal operation of the product.		
		(3) Grounding		
		• Grounding must be performed, in order to prevent electric shocks or electrostatic charge, enhance noise-resistant performance and control unnecessary electromagnetic radiation.		
		• For the ground terminal on the AC power cable of the controller and the grounding plate in the control panel, be sure to use a twisted pair cable with wire thickness 0.5mm ² (AWG20 or equivalent) or more for grounding work. For safeguard grounding, it is necessary to select an appropriate wire diameter for the load. Perform wiring that satisfies the specifications (electrical equipment)		
		technical standards).		
		 Perform Class D grounding (former Class 3 grounding, with ground resistance 100Ω or below). 		

No.	Operation	Precautions			
4	Installation	(4) Safety measures			
	and Startup	• When working with two or more persons, make it clear who is to be in charge			
		and communicate well with each other to ensure safety.			
		• When the product is operating or in the ready mode, take safety measures			
		(such as the installation of safety/protection fences) so that nobody can enter			
		the area within the robot's movable range. Contact with an operating robot			
		may lead to death or serious injury.			
		• Be sure to install an emergency stop circuit so that the unit can be stopped			
		immediately in an emergency during operation.			
		Take safety measures such that turning the power ON alone will not start up			
		the unit. Otherwise, this may cause the product to start unexpectedly, leading			
		to injury or product damage.			
		 Take safety measures such that emergency stop cancel or recovery after 			
		power failure alone will not start up the unit. Otherwise, this may lead to injury			
		or equipment damage.			
		• When installation or adjustment operation is to be performed, display signs			
		such as "Operating: No Power ON!" etc. Sudden power input may cause			
		electric shock or injury.			
		 Take measures to prevent workpieces, etc. from falling during power failures 			
		or emergency stop.			
		• Wear protection gloves, goggles and safety shoes, as necessary, to secure			
		safety.			
		• Do not insert fingers or objects into the openings in the product. Otherwise,			
		this may lead to injury, electric shock, product damage, or life.			
		• When releasing the black of a vehically offended actuator, be called that it			
5	Teaching	When working with two or more persons, make it clear who is to be in charge			
Ŭ	readining	and communicate well with each other to ensure safety.			
		Perform teaching operation from outside the safety/protection fence, if			
		possible. If operation must be performed within the safety/protection fence.			
		prepare "Work Regulations" and make sure that all the workers acknowledge			
		and understand them well.			
		 When operation is to be performed inside the safety/protection fence. 			
		operators should have emergency stop switches available at hand so that the			
		unit can be stopped at any time if abnormalities occur.			
		• When operation is to be performed inside the safety/protection fence, have a			
		monitor standing by in addition to the operator(s) so that the unit can be			
		stopped at any time if abnormalities occur. Also, keep watch on the operation			
		so that a third party cannot operate the switches carelessly.			
		Place a sign indicating "Operating" where it can be seen easily.			
		• When releasing the brake on a vertically oriented actuator, be careful that it			
		does not fall under its own weight, catching the operator's hand or damaging			
		workpieces.			
		* Safety/protection fence: If there is no safety/protection fence, the movable			
		range should be indicated.			

No.	Operation	Precautions		
6	Trial	When working with two or more persons, make it clear who is to be in charge		
	Operation	and communicate well with each other to ensure safety.		
		• After teaching or programming, carry out trial operation step by step before		
		switching to automatic operation.		
		• When trial operation is to be performed inside the safety/protection fence, use		
		the same work procedure, determined in advance, as teaching operation.		
		• Be sure to confirm program operation at safe speeds. Otherwise, this may		
		lead to accidents due to unexpected motion caused by program error, etc.		
		• Do not touch the terminal block or any of the various setting switches while the		
		equipment is live. Otherwise, this may lead to electric shock or abnormal		
		operation.		
7	Automatic	Check before starting automatic operation or restarting after operation stop		
	Operation	that there is nobody within the safety/protection fence.		
		• Before starting automatic operation, make sure that all peripheral equipment is		
		ready for automatic operation and that there is no alarm indication.		
		• Be sure to start automatic operation from outside the safety/protection fence.		
		• If the product produces abnormal heat, smoke, odor, or noise, immediately		
		stop it and turn OFF the power switch. Otherwise, this may lead to fire or		
		damage to the product.		
		• When a power failure occurs, turn OFF the power switch. Otherwise, this may		
		lead to injury or product damage due to unexpected product motion during		
		recovery from the power failure.		

No.	Operation	Precautions			
8	Maintenance	When working with two or more persons, make it clear who is to be in charge			
	and	and communicate well with each other to ensure safety.			
	Inspection	• Perform the work outside the safety/protection fence, if possible. If operation			
		must be performed within the safety/protection fence, prepare "Work			
		Regulations" and make sure that all the workers acknowledge and understand			
		them well.			
		• When work is to be performed inside the safety/protection fence, turn OFF the			
		power switch as a rule.			
		When operation is to be performed inside the safety/protection fence,			
		operators should have emergency stop switches available at hand so that the			
		unit can be stopped at any time if abnormalities occur.			
		• When operation is to be performed inside the safety/protection fence, have a			
		monitor standing by in addition to the operator(s) so that the unit can be			
		stopped at any time if abnormalities occur. Also, keep watch on the operation			
		so that a third party cannot operate the switches carelessly.			
		 Place a sign indicating "Operating" where it can be seen easily. 			
		• For the grease for the guide or ball screw, use appropriate grease according to			
		the Instruction Manual for each model.			
		• Do not perform dielectric strength testing. Otherwise, this may lead to damage			
		to the product.			
		• When releasing the brake on a vertically oriented actuator, be careful that it			
		does not fall under its own weight, catching the operator's hand or damaging			
		workpieces.			
		• The slider or rod may be misaligned from the stop position if the servo is			
		turned OFF. Avoid injury or damage due to unnecessary operation.			
		• Be careful not to lose the cover or any removed screws, and be sure to return			
		the product to the original condition after maintenance and inspection work			
		Otherwise, this may lead to product damage or injury due to incomplete			
		mounting.			
		* Safety/protection fence: If there is no safety/protection fence, the movable			
		range should be indicated.			
9	Modification	• Do not modify, disassemble/assemble, or use maintenance parts not specified			
	and	on your own discretion.			
	Disassembly				
10	Disposal	• When the product exceeds its useful life or is no longer needed, dispose of it			
		properly as industrial waste.			
		When removing the actuator for disposal, avoid dropping components when			
		detaching screws.			
		• Do not put the product in a fire when disposing of it. The product may rupture			
		or generate toxic gases.			
11	Other	 If you are equipped with a medical device such as a pacemaker, do not 			
		approach the product or its wiring, as the device may be affected.			
		See the Overseas Standard Compliance Manual to check compliance with			
		overseas standards if necessary.			
		• For the handling of actuators and controllers, follow the dedicated instruction			
		manual of each unit to ensure safety.			

Precaution Indications

The safety precautions are divided into "Danger", "Warning", "Caution" and "Notice" according to the warning level, as follows, and described in the Instruction Manual for each model.

Level	Degree of risk to persons and property	S	ymbol
Danger	This indicates an imminently hazardous situation which, if the product is not handled correctly, will result in death or serious injury.	Â	Danger
Warning	This indicates a potentially hazardous situation which, if the product is not handled correctly, could result in death or serious injury.	Â	Warning
Caution	This indicates a potentially hazardous situation which, if the product is not handled correctly, may result in minor injury or property damage.		Caution
Notice	This indicates a situation in which, while injury is not a likely result, the precautions should be observed in order to use the product appropriately.	!	Notice

RCON

Chapter

Overview

As well as other ROBO Cylinder controllers, RCON is complies with Modbus Protocol, enabling it to receive commands from the host and refer to information inside the controller. RCON is capable of RTU Mode which is a part of the serial transmission mode and TCP Mode with connectivity to Ethernet.

Modbus/TCP is a protocol capable of using the Modbus protocol conformed to EIA RS485 (in the serial transmission mode) on Ethernet (TCP/IP).

In RCON, Modbus/TCP communication can be established in connectivity to RCON-GW.

RCON

Chapter 2

Specifications

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2.1 Modbus RTU

Shown below is the specifications of RCON Modbus RTU.

ltem	Description
Interface	Conformed to EIA RS485
Communication Method	Half Duplex Communication
Max. Total Extended Length	100m
Synchronizing System	Start-Stop Synchronous
Connection Form	1: N Single-Ended Bus signaling (1 <= N <= 16)
Transmission Mode	RTU (Not applicable for ASCII Mode)
Communication speed (bps)	115200 (Fixed)
Bit length	8 bits
Stop bit	1 bit
Parity	None

Refer to "Serial Communication (Modbus Edition) Instruction Manual" for other specifications.

2.2 Modbus/TCP

Item	Description
Transmission speed	10M/100Mbps
Physical Layer	100BASE-TX
Topology	Star Type
Communication cable	Twisted pair: Category 5 or more
LAN connector	RJ-45
Communication protocol	Modbus/TCP
Used Port Number	502

Shown below is the specifications of RCON Ethernet applicable.

Ping response is also available in RCON-GW.

* Ping enables to check the network connection by the response if there is or not by using the echo command in ICMP (Internet Control Message Protocol) and sending a character string to the indicated destination (IP address or a name of host).

2.2.1 Communication Format

Communication should be established in the client/server system in TCP/IP, however, in Modbus/TCP, the Modbus master should be the TCP client while the Modbus slave is the TCP server.



In the Modbus communication, one set of communication completes by the Modbus slave making a response to the "demand message" from the Modbus master.

In Modbus/TCP, just like TCP/IP, it is necessary to establish the connections in order to establish the data transportation.

The Modbus slave should establish the connectivity by receiving the connection command from the Modbus master.

2.2.2 Each Setting Necessary for Communication

[1] Settings

No.	Data Name	Overview
1	IP address (for connection to RCON Ethernet)	Identification number in network layers indicated in order to have the IP identify devices in the network
2	Subnet mask (for connection to RCON Ethernet)	Numbers to identify the network address and the host address in the IP addresses.

[2] About Setting Tool

The data above is available for setting in the gateway parameter setting tool or IA-OS.

Setting Window in Gateway Parameter Setting Tool

Parameter Configuration T	ool for IAI GateWay Unit		- 🗆 🗙
ile Setting Monitor			
C Specialty Parameter	r		
Port Config	—		
TimeSetting(1)	Wri	te	
Co: Ethernet connection	on setting		
Network Type	CC-Link IE Field		Axis Type 2 🗸
	1		Number of Option Units 1 -
Network No.	11	-	Simple Direct (Size: 4W)
Node Address	1	-	
			Detail setting
Baud Rate	Auto	~	
Information	- Intelligent device no	de	
RA/RI	- 125 Point (lebyte)		
KRW/ KRL	= 12 Foinc(24byte)		
Simmara Vargion: 0007			
insuit ferbion. 0007			

J Ethernet connec	tion setting		
IP address	192 168	0.	1
Subnet mask	0.0.	•.	0
UDP port No.		49,1	52
MAC Address	B8 DC 87	FF F9	F 9
	OK		

Setting Window in IA-OS (Gateway: User parameter edit)

File Connectivity between PC and controller Par	ameter Position data Press program Monitor Backup Maintenance	Information				
File operation Setting	P		IAI Corporation			
status	User parameter edit[GW No.0]		- • •			
Control method : Teaching mode Safety velocity Enable Safety velocity Enable Safety circuit Exist	Save Transfer					
- # Baudrate : 115,200[bps]	Network setting Special parameters					
E- GW No.0 BCON-GWI	Name	Set value	^			
Alarm :Not occurred	Unit for velocity (only for Numerical Direct mode)	0:1mm/s				
Operation mode :MANU	Internal communication retry count	2				
	MON Signal	0:Enable				
	Calendar function	1:Enable				
	Driver shut-down release delay time [ms]	5				
	Power supply unit connection retry times	3				
	Power supply unit monitor type	0:Output voltage				
	Number of power supply units connected	0:Not Used				
	Waiting time for initialization internal process communication	3,000				
	Enable function	0:Disable				
	BYTE swap	0:Disable				
	Double-word data swapping	Double-word data swapping 0:Disable				
	Gateway IP address	192.168.0.1				
	Gateway subnet mask	255.255.255.0				
	UDP port No.	49,152				
	RCON-EC JOG switch	0:Enable				
	Input range:0.0.0 to 255.255.255					

2.2.3 How to Establish Communication Setup

Here explains regarding RCON Ethernet application how to set it up when communication is to be held in Modbus/TCP.

The setting of the PC software IA-OS is shown as an example for an explanation of setup.

[1] Connection Diagram



[2] IP Address Setup

(1) Click Special parameters tab in the User Parameter Edit window.

(2) Double-click the setting value box in the gateway IP address.

Jser parameter edit				
User parameter relic(OW No.0)				
Network setting Special parameters				
Name	Set value	^		
Unit for velocity (only for Numerical Direct mode)	0.1mm/s		I PVTE sugar	0.Disable
Internal communication retry count	2		BYTE swap	U:Disable
MON Signal	0 Enable		Double-word data swapping	0.Disable
Calendar function	1.Enable		Double-word data swapping	0.Disable
Driver shut-down release delay time (ms)	8		Gateway IP address	192,1681.1
Power supply unit connection retry times	3		Gateway in address	152.100.1.1
Power supply unit monitor type	0:Output voltage		Gateway subnet mask	7-355,255.0
Number of power supply units connected	CNot Used			
Waiting time for initialization internal process communication	3.000		UDP port No.	49.152
Enable function	0.Disable			
OVIC swop	Q.D sable		RCON-EC JOG switch	(∠) ():Enable
Double-word data swapping	0:0 sable			Double
Gateway IP address	192,168.1.1			Double
Gateway subnet mask	255,255,255.0		Input range:0.0.0.0 to 255.255.255.255	Click /
UDP pert No.	49,152			
RCON-EC IOG switch	Ofnasie			
Input range(0.0.0.0 to 255.255.255.255				

(3) Parameter input window should appear. Make an input to the setting box and click OK .



(4) Double-click the setting value box in the gateway subnet mask.

User parameter edit				
User parameter edit[GW No.0]				
Save Transfer				
Network setting Special parameters				
Name	Set value	^		
Unit for velocity (only for Numerical Direct mode)	0:1mm/s		BYTE swap	0:Disable
Internal communication retry count	2			
MON Signal	0:Enable		Double-word data swapping	0:Disable
Calendar function	1:Enable	and the second		100 100 000 00
Driver shut-down release delay time [ms]	5	and the second	Gateway IP address	192.168.250.20
Power supply unit connection retry times	3	and the second	Catavan subast mark	
Power supply unit monitor type	0:Output voltage	and the second	Gateway subnet mask	235.255.255.0
Number of power supply units connected	0:Not Used	and the second	LIDP port No	/9152
Waiting time for initialization internal process communication	3.000	and the second	obi por no.	
Enable function	0:Disable	and the second	RCON-EC JOG switch	0:Enable
BYTE swap	0:Disable			
Double-word data swapping	0:Disable		7 (4	
Gateway IP address	192.168.250.20		Input range:0.0.0.0 to 255.255.255.255	hla)
Gateway subnet mask	255.255.255.0		Dou	
UDP port No.	49,152			ck /
RCON-EC JOG switch	0tEnable			
Insul range(0.0.0.1 to 255.255.255.255				

(5) Parameter input window should appear. Make an input to the setting box and click OK .



(6) Make an input to the UDP port No. setting value box.



[3] Parameter Transfer and Write-in

(1) Click Transfer in the User Parameter Edit window.



- (2) Click OK in the Confirmation Process Content During Parameter Transfer window.
 - Confirmation Process Content During Parameter Transfer



(3) Information window should appear after transfer is complete. Click OK .

Information	
Information	
Parameter transfer has	completed.
	✓ ox
	(3)
	Click

(4) Information window should appear after the software reset is complete. Click OK .

Information	_
Information	
The software reset has completed. [GW No.0][Axis No. 0,1,2,3]	
Ск	
	(4) Click

Now, the setup for the Ethernet communication in the RCON system is finished. Next, proceed for the communication confirmation by Ethernet connection using IA-OS.

[4] Communication Confirmation by Ethernet Connection

(1) Click Connect found in the "Connectivity between PC and controller" tab in the IA-OS menu bar.



(2) The Communication method selection window should appear. Click Communication setting .



 (3) The Application setting window should show up.
 Input the values in "Search start port number", "Number of search ports" and "Port number on PC side" in Ethernet Communication Setting and click OK .

Application setting			
Application setting		×	
Appin sourd setting - Message display setting - Controller name display setting - Side menu / model selection list - Side menu / model selection list - Side menu / model selection list - Side setting - Satus display setting - Backup setting - Backup setting - Satus display setting - S	Communication setting ☑ Activate communication port searching feature ☑ Search each time the communication port selection starts ○ ny when communication port searching feature is enabled ☑ Permit connection of power supply unit Ethernet communication setting Search start port number 49,152 毫 Number of search ports 1毫 Port number on PC side 51,190 毫		 In the example, input as follows; Search start port number → 49, 152 Number of search ports → 1 Port number on PC side → 51, 190 (All in default)
Click here to check more detailed explanations.		25	(3) Click

(4) Click Ethernet communication (LAN port) in the Communication method selection window.



(5) The Select communication port should be displayed and the communication port searching for those available for connectivity should start. Select an Ethernet communication port to connect in the status box in the window and click Start communication .





Caution

If the IP address would not show up in the communication port list at this time, it means that the communication with the Ethernet connection is not established. In case the communication is not established, check the condition of insertion or breakage of communication cable connected to the controller, or if there is any mistake in the settings such as the IP address or parameter setting.

(6) The Communication establishment window should appear. Once the result of the subject connection axis is shown, click OK .

5 items of connection success (0 items with data not matched) 0 items of connection failure COM port name Controller number Controller name Result Mess V32 168 35020 CM Non CONLOW The connection has reasoned The connection has reasoned	e
COM port name Controller number Controller name Result Mess	
192 168 250 20 GW No 0 PCON-GW A The connection has succeed	isage Connect ^
152.100.250.20 GW No.0 Reconvert	led. 🗹 🗸
Click here to check	

(7) Click Yes in the Warning window.

Warn	ning	
Warnin	ng	
<u> </u>	This application can operate the actuator. Do you have a safety circuit to immediately stop the actuator in hand? * Actuator operation with this application is available only when the safety circuit is prepare	d. No
)

(8) Make a selection in the MANU Operation Mode setting window and click OK .



(9) The status of the connected RCON should be displayed on the left in the IA-OS main window.

N	/lain menu	
The status of each unit in the connected RCON system should be displayed.	Alam menu Second Second Secon	3 1

2.2.4 Communication Details

[1] Message format

Shown below is a list of the Modbus/TCP message formats.

Modbus/TCP			
Address	Data		
00н	Transaction Identifiers		
01н			
02н	Drotocol Idontifioro		
03н	FIOLOCOLIDEITUIIEIS		
04н	Mossage Longth		
05н	Message Lengin		
06н	Unit Identifier		
07н	Function Code		
08н	D. t.		
	Data		



The Modbus/TCP message formats should be the formats included in the Modbus/RTU formats with "CRC" removed.

In the Modbus/TCP, "CRC" is not necessary in order to use the check feature in the TCP/IP protocols.

Shown below is the details of the data.

No.	Data Name	Overview		
1	Transaction Identifiers	Data that the Modbus master adds in the purpose of the transaction administration (returns a copy in the response message from the Modbus slave)		
2	Protocol Identifiers	Fixed at 0 (Not for use)		
3	Message Length Number of the bytes till the end of the data from unit identifiers			
4	Unit Identifier Data to specify Modbus slave, same as Modbus/RTU slave address			
5	Function Code	Shows demand type same as Modbus/RTU		
6	Data	Formats specified for each function		

RCON



Available Function Codes

RCON memory domains consist of the Modbus register domains that are written in the word units and the Modbus status domains that are written in bit (coil) units, and the function codes should differ depending on the construction.

Momony Domain	Access Unit	Function			
Memory Domain	Access onit	Code	Feature		
Modbus status	Readout of Coils				
		03н	Readout of Multiple Retained Registers		
		04н	Readout of Input Register		
Modbus resistor	Word	06н	Write-in to Holding Register		
		10н	Lump Write-in to Multiple Holding Registers		
		17 _Н	Readout and write-in to Registers		

RCON

Chapter

Connectable RCON Units

Shown below are the RCON units connectable and the unit identifiers.

No.	Unit name	Unit Identifier	
1	RCON-GW	D0н (D1н) or FFн	
2	RCON-PC/PCF/AC/DC/SC	Axis number from 01_{H} to 10_{H} (for 16 axes) to be	
3	SCON-CB-RC	indicated	
*	RCON-EC unit is not applicable.		

RCON-EC unit is not applicable.

RCON

Chapter 5

Details of RCON Unit Registers

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5.2

5.1 RCON-GW Internal Address and Data Construction

Shown below is the Modbus register construction of RCON-GW.

0000 _н to 28FF _н	(For system)
2900 _н to 29EF _H	All Axes Monitor Domains
29F0 _н to 32FF _н	(For system)
3300 _н to 3301 _н	Data Domains for Preventive/Predictive Maintenance
3302 _н to 33FF _н	(For system)
3400н to 343Bн	Power Supply Unit Monitor Aria
343Cн to 36FFн	(For system)
3700н to 370Ан	Mirror Domains (Monitor)
370Bн to FFFFн	(For system)

* There should be no access to the system domains.

5.1.1 Details of RCON-GW Modbus Registers

Address [HEX]	Area name	Description		Symbol	Word Counts	Unit
0000_{H} to $28FF_{H}$	For system					
		Offset [HEX]				
		+0000 _H	Absolute Position Counter Current Position	PNOW	2	0.01mm
		+0002 _H	Current Velocity Monitor	VNOW	2	0.01mm/sec
		+0004 _H	Current • PC: Command Current • AC/DC/SC: Feedback current	CNOW	2	mA
	A.I	+0006 _H	Currently Occurred Alarm Code	ALMC	1	
2900_{H} to 29EF_{H}	All axes monitor domains	+0007 _H	Device Status Register 1 (Refer to 5.1.2 [1])	DSS1	1	
		+0008 _H	Extension Device Status Register (Refer to 5.1.2 [2])	DSSE	1	
		+0009 _H	Special Input Port Monitoring Register (Refer to 5.1.2 [3])	SIPM	1	
		+000A _H	Overload Level Monitor	OLLV	1	%
		+000B _H	Deviation Monitor	DEVI	2	pulse
		+000D _H	System status (Refer to 5.1.2 [4])	STAT	2	
	* Address = 2900 _H + (15 × axis No. ^{(N}	^{ote 1)}) + offset			
$29F0_{\text{H}}$ to $32FF_{\text{H}}$	For system					
3300 _н	Data domains for preventive/predictive maintenance	Total conducting time (sec)		TIMC	2	S
3302_{H} to 33FF_{H}	For system					
	Power supply unit monitor	Offset [HEX]				
		+0000 _H	Output voltage	VOUT	1	0.1V
		+0001 _H	Supplement coil voltage	VAUX	1	0.1V
		+0002 _H	Peak hold voltage	VPAK	1	0.1V
		+0003 _H	Output current	IOUT	1	mA
		+0004 _H	Peak hold current	APAK	1	mA
3400 _H to 343B _H		+0005 _H	Load ratio	LOUT	1	%
		+0006 _H	Peak hold load ratio	LPAK	1	%
		+0007 _H	FAN revolution speed	FANS	1	rpm
		+0008 _H	PCB temperature	TEMP	1	°C
		+0009 _H	Power Supply Status (Refer to 5.1.2 [5])	VSTA	1	
		+000A _H	Total conducting time	TTIM	2	s
	* Address = 3400 _H + (12 × Power su	pply unit No. ^(Note 2)) + offset			
$343C_{\rm H}$ to $36FF_{\rm H}$	For system					
3700 _H		Gateway statu	us register (Refer to 5.1.2 [6])	GWSR	1	
3701 _H		Gateway status register 2 (Refer to 5.1.2 [7]) Reservation Link Status (Active Low)		GSR2	1	
3702 _H				-	_	
3703 _H	Mirror domains			NLNK	1	
3704 _H	(Monitor)	System Timer		STIM	2	
3706 _H		Current time		TIMN	2	
3708 _H]	Alarm code		ALMC	2	
370A _H		PS Link Status	s (Active Low)	NPLK	1	
370B _H to EEE	For system					

Shown below is the details of the Modbus registers for RCON-GW.

Note 1 Axis numbers are 16 axes of "0 - 15".

Note 2 Power supply unit numbers are five units of "0 - 4".

5.1.2 Details of RCON-GW Individual Registers

[1] Details of Device Status Register 1: DSS1

Bit	Symbol	Name	Remarks
15	EMGS	EMG Status Bit	
14	SFTY	Safety Speed Valid Status Bit	
13	PWR	Controller Ready Status Bit	
12	SV	Servo-On Status Bit	
11	PSFL	Contactless Push Stop	
10	ALMH	Critical Malfunction (Alarm) Status Bit	
9	ALML	Light Malfunction (Warning) Status Bit	
8	ABER	Absolute Error Status Bit	
7	BKRL	Brake Compulsory Release Status Bit	
6	—		
5	STP	Pausing Status Bit	
4	HEND	Home-Return Complete Status Bit	
3	PEND	Positioning Complete Status Bit	
2	—		
1	—		
0	MEND	Movement Complete Status Bit	

Bit	Symbol	Name	Remarks
15	EMGP	Emergency Stop Status Bit	
14	MPUV	Motor Voltage Drop Status Bit	
13	RMDS	Operation Mode Status Bit	0: AUTO 1: MANU
12	—		
11	GHMS	Home-Returning Status Bit	
10	PUSH	During push-motion Operation	
9	PSNS	Excitation Detection Status Bit	
8	PMSS	PIO/Modbus Switchover Status	0: PIO 1: Modbus
7	_		
6	—		
5	MOVE	Moving Signal	
4	—		
3	—		
2	—		
1	_		
0	—		

[2] Details of Extension Device Status Registers: DSSE

Bit	Symbol	Name	Remarks
15	SWJ-	JOG Switch Monitor	0: OFF 1: Jog in Negative Direction
14	—		
13	SWJ+	JOG Switch Monitor	0: OFF 1: Jog in Positive Direction
12	—		
11	—		
10	—		
9	—		
8	—		
7	—		
6	—		
5	—		
4	BLCT	Belt Breakage Sensor Input Status	
3	HMCK	Home Position Check Sensor Monitor	
2	ОТ	Travel Exceeding Sensor Input Status	
1	CREP	Creep Sensor Input Status	
0	LS	Limit Sensor Input Status	

[3] Details of Special Input Port Monitoring Registers: SIPM

[4] Details of System Status: STAT

Bit	Symbol	Name	Remarks
31	BATL	ABS Battery Voltage Drop	
30	OVLW	Overload Warning Status	
29	—		
28	SSTO	External Torque Shutoff Demand Signal Status	
27	—		
26	—		
25	—		
24	—		
23	—		
22	—		
21	—		
20	—		
19	—		
18	—		
17	ASOF	During AUTO servo OFF	
16	—		
15	—		
14	—		
13	—		
12	—		
11	—		
10	—		
9	—		
8	—		
7	-		
6	—		
5	_		
4	RMDS	Operation Mode Status	0: AUTO 1: MANU
3	HEND	Home-Return Complete Status	
2	SV	Servo ON Status	
1	SON	Servo ON Command	
0	MPOW	Drive Source Turned on	

Bit	Symbol	Name	Remarks
15	_		
14	—		
13	—		
12	—		
11	_		
10	—		
9	—		
8	—		
7	—		
6	—		
5	—		
4	RATS	Rated Status	0: 220W (With No FAN) 1: 330W (With FAN)
3	FANS	FAN Driving Status	0: FAN Stopped 1: FAN Driving
2	FANC	FAN Connection Status	0: Unconnected 1: Connected
1	FANW	FAN Warning Status	0: Normal Revolution Count 1: Warning Detected
0	FANA	FAN Error Status	0: Normal Revolution Count 1: Error detection

[5] Details of Power Supply Status: VSTA

Bit	Symbol	Name	Remarks
15	GWMD	Gateway Operation Mode	0: AUTO 1: MANU
14	MONS	MON (Fieldbus Command Activated) Status	
13	ERRT	ERR-T monitor	Added in V00006 and later
12	ERRC	ERR-C monitor	Added in V00006 and later
11	—		
10	—		
9	—		
8	—		
7	—		
6	—		
5	—		
4	—		
3	—		
2	—		
1	—		
0	—		

[6] Details of Gateway status register: GWSR

Bit	Symbol	Name	Remarks
15	_		
14	—		
13	_		
12	—		
11	—		
10	—		
9	—		
8	—		
7	—		
6	—		
5	_		
4	—		
3	_		
2	ATST	AUTO/MANU Status	
1	EMST	Emergency Stop Input Status	
0			

[7] Details of Gateway status register 2: GSR2

5.2 Construction and Details of Driver Unit Modbus Registers

Shown below is the construction of the Modbus registers in the driver unit.

0000_{H} to $8FFF_{H}$	(For system)
$0D00_{H}$ to $0D01_{H}$	I/O Control Information Categories
$0D02_{H}$ to $8FFF_{H}$	(For system)
9000н to 902Fн	Controller Monitoring Information
9030н to 92FFн	(For system)
9300н to 9313н	Maintenance Information
9314н to 93FFн	(For system)
9400н to 943Bн	Manufacturing Information
943C _H to FFFF _H	(For system)
9800н	Position Command Categories
9801н to 98FFн	(For system)
9900н to 9908н	Direct Numeric Command Categories
9909н to 99FFн	(For system)
9A00н to 9A02н	Simple Direct Numeric Command Categories
9A03н to FFFFн	(For system)

* There should be no access to the system domains.

5.2.1 Details of Driver Unit Modbus Registers

Shown below is the details of driver unit Modbus registers.

Address [HEX]	Area name	Description	Symbol	Word Counts	Unit	RCON-PC/PCF	RCON-AC	RCON-DC	RCON-SC	SCON-CB-RC	
0000 _H to 0CFF _H	For system										1
0D00 _H	I/O Control Information Categories	Device Control Register 1 (Refer to 5.2.2 [1])	DRG1	1		0	0	0	0	0	
0D01 _H		Device Control Register 2 (Refer to 5.2.2 [2])	DRG2	1		0	0	0	0	0	
9000 _H	Controller Monitoring Information	Absolute Position Counter Current Position	PNOW	2	0.01mm (Note 1)	0	0	0	0	0	
9002 _H		Currently Occurred Alarm Code	ALMC	1		0	0	0	0	0	1
$9003_{\rm H}$ to $9004_{\rm H}$		Not for use									1
9005 _н		Device Status Register 1 (Refer to 5.2.2 [3])	DSS1	1		0	0	0	0	0	
9006 _H		Device Status Register 2 (Refer to 5.2.2 [4])	DSS2	1		0	0	0	0	0	
9007 _H		Extension Device Status Register (Refer to 5.2.2 [5])	DSSE	1		0	0	0	0	0	
9008 _H		System status (Refer to 5.2.2 [6])	STAT	2		0	0	0	0	0	
900A _H		Current Velocity Monitor	VNOW	2	$0.01 mm/sec^{(Note \ 1)}$	0	0	0	0	0	1
900C _H		Current (Torque Current)	CNOW	2	mA	0	0	0	0	0	1
900E _H		Deviation Monitor	DEVI	2	pulse	0	0	0	0	0	1
9010 _H		System Timer	STIM	2	msec	0	0	0	0	0	1
9012 _H		Special Input Port Monitoring Register (Refer to 5.2.2 [7])	SIPM	1		0	0	0	0	0	
9013 _H		Zone Status Register (Refer to 5.2.2 [8])	ZONS	1		0	0	0	0	0	
9014 _H		Position Number Status Register (Refer to 5.2.2 [9])	POSS	1		0	0	0	0	0	
9015 _H		Extension System Status Register (Refer to 5.2.2 [10])	SSSE	1		0	0	0	0	0	
$9016_{\rm H}$ to $9019_{\rm H}$		Not for use									1
901A _H		Feedback urgent (Torque Current)	CNWF	2	mA	×	0	0	0	0	1
$901C_{\text{H}}$ to $901F_{\text{H}}$		Not for use									1
9020 _H		Overload Level Monitor	OLLV	2	%	0	0	0	0	0	1
9022_{H} to $902F_{\text{H}}$		Not for use									1
9030_{H} to 92FF_{H}	For system										1
9300 _H	Maintenance information (Note 3)	Total moving count	ттім	2	Times	0	0	0	0	0	
9302 _H		Total drive distance	ODOM	2	m	0	0	0	0	0	1
9304 _H		Max. Drive Supply Voltage	FMAX	1	0.1V	Ο	0	0	×	×	1
9305 _H		Max. Control Voltage	VMAX	1	0.1V	0	0	0	×	×	1
9306 _H		Max. Motor Current	CMAX	2	mA	×	0	0	0	0	1
9308 _H		Total conducting time	TTIM	2	sec	0	0	0	0	0	1
930A _H		Emergency Stop Input Count	EMGC	2	Times	Ο	0	0	0	0	1
930C _H		Average PCB Temperature	TEMP	1	°C	0	0	0	0	0	1
930D _H		Max. PCB Temperature	TEMP	1	°C	0	0	0	0	0	1
930E _H		Max. PCB Temperature Detected Time	TTPM	2	s	0	0	0	0	0	1
9310 _H		Not for use									1
9311 _H		Max. Motor Overload Ratio	OLMX	1	%	0	0	0	0	0	1
9312 _H		Max. Motor Overload Ratio	TOLM	2	s	0	0	0	0	0	
9314_{H} to $93FF_{H}$	For system										

	5.2	Construction	and Details	of Driver	Unit Modbu	us Registers
--	-----	--------------	-------------	-----------	------------	--------------

						-				(0
Address [HEX]	Area name	Description	Symbol	Word Counts	Unit	RCON-PC/PCF	RCON-AC	RCON-DC	RCON-SC	SCON-CB-RC
9400 _H	Manufacturing information (Note 2) (Note 3)	Serial code 1	CTS1	2		0	0	0	0	0
9402 _H		Serial code 2	CTS2	2		0	0	0	0	0
9404 _H		Serial code 3	CTS3	2		0	0	0	0	0
9406 _H		Serial code 4	CTS4	2		0	0	0	0	0
9408_{H} to $943B_{\text{H}}$		Not for use								
9800 _H	Position Command Categories	Position Number Indication Register	POSR	1		0	0	0	0	0
9803_{H} to 98FF_{H}	For system									
9900 _н	Direct Numeric Command Categories	Target Position Indication Register	PCMD	2	0.01mm ^(Note 1)	0	0	0	0	0
9902 _H	0	Positioning Band Indication Register	INP	2	0.01mm ^(Note 1)	0	0	0	0	0
9904 _H		Velocity Indication Register	VCMD	2	0.01mm/s (Note 1)	0	0	0	0	0
9906 _H		Acceleration/Deceleration Indication Register	ACMD	1	0.01G	0	0	0	0	0
9907 _H		Pressing Current Limit Indication Register	PPOW	1	%	0	0	0	0	0
9908 _H		Control Flag Indication Register	CTLF	1		0	0	0	0	0
$990A_{\rm H}$ to $99FF_{\rm H}$	For system									1
9A00 _H	Simple Direct Numeric Command Categories	Target Position Indication Register	PCMD	2		0	0	0	0	0
9A02 _H		Position Number Indication Register (except for target position)	PPOS	1	0.01mm ^(Note 1)	0	0	0	0	0
9903_H to FFFF _H	For system									

 Note 1
 Depends on equipment unit system

 Note 2
 All data in ASCII code

 Note 3
 SCON-CB-RC is applicable from V000D and others from the initial version.

5.2.2 Details of Driver Unit Individual Registers

RCON-PC/PCF SCON-CB-RC RCON-AC RCON-DC RCON-SC Bit Symbol Name Remarks 0 EMG **EMG** Operation Indication Ο 0 0 Ο 15 0 Ο Ο 14 SFTY Safety Velocity Indication Ο Ο 13 _ Servo ON Command Ο 12 SON Ο Ο Ο Ο 11 _ 10 — 9 _ Alarm Reset Command ALRS Ο 8 Ο Ο Ο Ο 7 BKRL Brake Compulsory Release Command Ο Ο Ο Ο Ο 6 5 STP Pause Command Ο Ο Ο Ο Ο 4 HOME Home-Return Command Ο Ο Ο Ο Ο 3 _ 2 — 1 _ _ 0

[1] Details of Device Control Register 1: DRG1

Bit	Symbol	Name	RCON-PC/PC	RCON-AC	RCON-DC	RCON-SC	SCON-CB-R	Remarks
15	JVEL	Jog Velocity / Inching Distance Switchover	Э́н О	0	0	0	с О	
14	JISL	Jog/Inching Switchover	0	0	0	0	0	
13	—							
12	—							
11	MOD	Teaching Mode Command	0	0	0	0	0	
10	TEAC	Position Data Read-in Command	0	0	0	0	0	
9	JOG+	Jog + Command	0	0	0	0	0	
8	JOG-	Jog - Command	0	0	0	0	0	
7	—							
6	—							
5	—							
4	—							
3	—							
2	—							
1	—							
0	—							

[2] Details of Device Control Register 2: DRG2

[3]	Details	of Device	Status	Register	1:	DSS1

Bit	Symbol	Name	RCON-PC/PCF	RCON-AC	RCON-DC	RCON-SC	SCON-CB-RC	Remarks
15	EMGS	EMG Status Bit	0	0	0	0	0	
14	SFTY	Safety Speed Valid Status Bit	0	0	0	0	0	
13	PWR	Controller Ready Status Bit	0	0	0	0	0	
12	SV	Servo-On Status Bit	0	0	0	0	0	
11	PSFL	Contactless Push Stop	0	0	0	0	0	
10	ALMH	Critical Malfunction (Alarm) Status Bit	0	0	0	0	0	
9	ALML	Light Malfunction (Warning) Status Bit	0	0	0	0	0	
8	ABER	Absolute Error Status Bit	0	0	0	0	0	
7	BKRL	Brake Compulsory Release Status Bit	0	0	0	0	0	
6	—							
5	STP	Pausing Status Bit	0	0	0	0	0	
4	HEND	Home-Return Complete Status Bit	0	0	0	0	0	
3	PEND	Positioning Complete Status Bit	0	0	0	0	0	
2	_							
1	_							
0	MEND	Movement Complete Status Bit	0	0	0	0	0	

Bit	Symbol	Name	RCON-PC/PCF	RCON-AC	RCON-DC	RCON-SC	SCON-CB-RC	Remarks
15	ENBS	Enable Status	0	0	0	0	0	
14	—							
13	LOAD	Overload Output Judgment Status	0	0	0	0	0	
12	TRQS	Torque Level Status	0	0	0	0	0	
11	MODS	Teaching Mode Status	0	0	0	0	0	
10	TEAC	Position Data Read-in Command Status	0	0	0	0	0	
9	JOG+	Jog + Status	0	0	0	0	0	
8	JOG –	Jog - Status	0	0	0	0	0	
7	—							
6	_							
5	—							
4	_							
3	—							
2	—							
1	—							
0	_							

[4] Details of Device Status Register 2: DSS2

Bit	Symbol	Name	RCON-PC/PCF	RCON-AC	RCON-DC	RCON-SC	SCON-CB-RC	Remarks
15	EMGP	Emergency Stop Status Bit	0	0	0	0	0	
14	MPUV	Motor Voltage Drop Status Bit	0	0	0	0	×	
13	RMDS	Operation Mode Status Bit	0	0	0	0	0	0: AUTO 1: MANU
12	—							
11	GHMS	Home-Returning Status Bit	0	0	0	0	0	
10	PUSH	During Push-motion Operation	0	0	0	0	0	
9	PSNS	Excitation Detection Status Bit	0	0	0	×	×	
8	PMSS	PIO/Modbus Switchover Status	0	0	0	0	0	0: PIO 1: Modbus
7	—							
6	—							
5	MOVE	Moving Signal	0	0	0	0	0	
4	—							
3	—							
2	—							
1	—							
0	—							

[5] Details of Extension Device Status Registers: DSSE

[6] Details of System status: STAT

Bit	Symbol	Name	RCON-PC/PCF	RCON-AC	RCON-DC	RCON-SC	SCON-CB-RC	Remarks
31	BATL	ABS Battery Voltage Drop	×	×	×	×	0	
30	OVLW	Overload Warning Status	0	0	0	0	0	
29	—							
28	SSTO	External Torque Shutoff Demand Signal Status	×	×	×	0	0	
27	—							
26	—							
25	—							
24	—							
23	—							
22	—							
21	—							
20	—							
19	-							
18	—							
17	ASOF	During AUTO servo OFF	0	0	0	0	0	
16	—							
15	-							
14	-							
13	-							
12	—							
11	—							
10	—							
9	—							
8	—							
7	_							
6	_							
5	-		0	\sim	\sim	0	0	
4	RMDS	Uperation Mode Status	0	0	0	0	0	
3			0	0	0	0	0	
2	SV	Serve ON Command	0	0	0	0	0	
1	SUN		0	0	0	0	0	
0	MPOW	Drive Source Turned on	0	0	0	0	0	

Bit	Symbol	Name	RCON-PC/PCF	RCON-AC	RCON-DC	RCON-SC	SCON-CB-RC	Remarks
15	SWJ-	JOG Switch Monitor	0	0	0	0	×	0: OFF 1: Jog in Negative Direction
14	_							
13	SWJ+	JOG Switch Monitor	0	0	0	0	×	0: OFF 1: Jog in Positive Direction
12	—							
11	—							
10	—							
9	—							
8	—							
7	—							
6	—							
5	—							
4	BLCT	Belt Breakage Sensor Input Status	×	×	×	0	0	
3	HMCK	Home Position Check Sensor Monitor	0	0	0	×	×	
2	ОТ	Travel Exceeding Sensor Input Status	×	×	×	0	0	
1	CREP	Creep Sensor Input Status	×	×	×	0	0	
0	LS	Limit Sensor Input Status	×	×	×	0	0	

[7] Details of Special Input Port Monitoring Registers: SIPM

Bit	Symbol	Name	RCON-PO	RCON	RCON	RCON	SCON-C	Remarks
			C/PCF	-AC	-DC	-SC	B-RC	
15	—							
14	—							
13	—							
12	—							
11	—							
10	—							
9	—							
8	ZP	Position Zone Output Monitor	0	0	0	0	0	
7	—							
6	—							
5	—							
4	—							
3	—							
2	—							
1	Z2	Zone Output Monitor 2	0	0	0	0	0	
0	Z1	Zone Output Monitor 1	0	0	0	0	0	

[8] Details of Zone Status Register: ZONS

Bit	Symbol	Name	RCON-PC/PCF	RCON-AC	RCON-DC	RCON-SC	SCON-CB-RC	Remarks
15	—							
14	_							
13	—							
12	_							
11	—							
10	_							
9	—							
8	_							
7	—							
6	PM64	Complete Position Number Status Bit 64	0	0	0	0	0	
5	PM32	Complete Position Number Status Bit 32	0	0	0	0	0	
4	PM16	Complete Position Number Status Bit 16	0	0	0	0	0	
3	PM8	Complete Position Number Status Bit 8	0	0	0	0	0	
2	PM4	Complete Position Number Status Bit 4	0	0	0	0	0	
1	PM2	Complete Position Number Status Bit 2	0	0	0	0	0	
0	PM1	Complete Position Number Status Bit 1	0	0	0	0	0	

[9] Details of Position Number Status Register: POSS

Bit	Symbol	Name	RCON-PC/PCF	RCON-AC	RCON-DC	RCON-SC	SCON-CB-RC	Remarks
15	—							
14	—							
13	—							
12	—							
11	ALMC	Cold Start Level Alarm	0	0	0	0	0	
10	—							
9	—							
8	—							
7	—							
6	—							
5	—							
4	—							
3	—							
2	—							
1	—							
0	-							

[10] Details of Extension System Status Register: SSSE

Bit	Symbol	Name	RCON-PC	RCON-	RCON-	RCON-	SCON-CI	Remarks
			:/PCF	AC	DC	SC	B-RC	
15	—							
14	—							
13	NTC1	Anti-Vibration Control Number	×	0	×	0	0	
12	NTC0	Anti-Vibration Control Number	×	0	×	0	0	
11	—							
10	—							
9	—							
8	—							
7	MOD1	Acceleration/Deceleration Mode	0	0	0	0	0	
6	MOD0							
5	GSL1	Gain Set	×	0	×	0	0	
4	GSL0							
3	INC	Incremental	0	0	0	0	0	
2	DIR	Pressing Direction	0	0	0	0	0	
1	PUSH	Pressing Operation	0	0	0	0	0	
0	—							

[11] Details of Control Flag Indication Register: CTLF

RCON



Caution

Pay attention to the following things when having Modbus to control or check conditions of the RCON system.

No.	Description
1	As any axis number is available for choice and setting in RCON, the seeable orders may not be matched with axis numbers in some parameter settings.
2	RCON is not applicable for broadcast commands.
3	The baud rate should be fixed at 115.2Kbps. However, connecting to a PC software or teaching tool provided by IAI should set the baud rate to that of the PC software or the teaching tool.
4	The timing to send a response should be determined by the unit construction of RCON. Unlike other CON system controller, free setting in accordance with the slave station transmitter activation minimum latency is not available.
5	Make sure to perform control with the Modbus commands in MANU Mode.
	 There are three types of communication ports as below for the RCON gateway unit. SIO (RS485 Round Connector) USB port (USB mini-B Connector) Ethernet port (Optional Setting) There is no priority for each communication port and the process is to be conducted in the order of data received. Under this condition, you should pay attention to the followings: Do not attempt to connect tools to multiple ports at the same time and conduct writing
6	or commands. [Reason (1)] As there is a concern of unexpected operation in case there is writing or commands from multiple ports at the same time. [Reason (2)] As there is a concern that the change data would not get reflected to the tool window that was not changed in case there is a change in the position data or a parameter from another port while a tool is connected to a communication port on one side.
	 There is a concern that operation or a response may get slow if connection is established to several ports at the same time.

Revision history

Revision date	Revised content
2020.03	First Edition
2020.09	Second Edition Function Codes 06_H , 10_H and 17_H added, published registers added and Chapter 5 and Chapter 6 added accordingly
2021.04	Edition 2B Chapter 2 Procedures added for how to set up communication Chapter 5 Reference added for 5.2.1, orders changed for description for each register in 5.2.2 Chapter 6 No. 6 added



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