B&PLUS

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RFID System Z Series

Technical Manual for Identification Processor

Type code: Z4-C001

CC-Link Interface



Thank you very much for purchasing the RFID system Z series of B&PLUS lately. Before using this Processor, read this manual carefully and operate properly, paying attention to the safety aspects.

Safety Considerations

(Please read this before use)

Before using this Processor, read this manual carefully and operate properly, paying attention to the safety aspects.

Incorrect handling may cause not only malfunction or failure, leading to an accident or injury. In this manual, the instructions are described in the following two levels.



The incorrect handling may cause hazardous conditions that lead to death or serious injury.

Attention

The incorrect handling may cause hazardous conditions that lead to injury of human or equipment.

Application	 This manual applies to Processors in Z4-C001. Carefully read this manual before using the Processor and handle the product correctly. Installation and operation should be carried out by trained personnel who has knowledge of electrical equipment.
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Design considerations	 Even if the abnormality of power supply and this product break down, please design the system so that the whole system acts on the safe side. About power supply and using conditions, be carefle not to exceed the range of specifications.
\land Caution	 About the standard or the rule, to which your equipment should adapt, please do appropriate measures after confirm by yourself. It is the responsibility of the operator to ensure that the locally applicable safety regulations are maintained.

Wiring	igodelta Wiring should be carried out after the power is turned off.
considerations	\blacklozenge When wiring the Processor, follow the chapters containing the wiring diagrams
Attention	closely, and wire all connections properly. Incorrectly connected wiring may cause malfunction or unexpected problems.

	$igodoldsymbol{\leftarrow}$ Unauthorized work and improper use will void the warranty and liability.
Usage	igoplus Please carry out the periodical confirmation of the system including setting
considerations	environment and the apparatus concerned.
	\blacklozenge The Processor must be operated only using approved power supplies.
	There is a risk of fire or heat generation exceeds the rated voltage power is being
Attention	supplied.
	\blacklozenge Be sure to turn off the power before cleaning, maintenance and failure treatment.
	Do not touch the terminals while the electricity is on.
	\blacklozenge Do not disassemble or modify the Processor. It may cause failure, malfunction,
	injury or fire.
	igodelet When disposing of the Processor, treat it as industrial waste.

< Note >

- (1) Specifications and contents in this manual are subject to change without notice
- (2) Please let us know if there is any mistake or notice in this manual

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1.1 Description

[B&PLUS RFID System Z series] is an RFID System system for factory automation that executes reading and writing data by inductive coupling principle.

Processor Z4-C001 is connected to CC-Link as a remote device station and communicates with Sequencer CPU of master / local station.

There can be 2 Read/Write heads connected to the Processor, and it executes read/write communication with Data carrier per each channel separately.

It is possible to read and write data to Data carrier from Sequencer CPU with programming an easy sequence program.

1.2 System configuration



Component	Function				
Data carrier	A data medium that stores and retains information (data).				
Read/Write head	It reads and writes Data carrier information/data without physical				
	contact aswell as supplies power for Data carrier.				
Processor	When it receives instructions from Sequencer CPU, it executes				
	reading orwriting data to or from Data carrier. It can be connected 1 or				
	2 Read/Write head(s).				

[Note for System construction]

The occupied stations of Processor Z4-C001 is 4 stations, therefore, plural Processors can be connected to a master unit within the allowable number of station.

Please decide the number of Processors to be connected to the master unit in considering the following points.

- (1) Maximum number of connectable stations for master unit is 16. (occupied 64 stations)
- (2) The number of occupied station of the units (input/output card etc.) except Processors, and Input/Output occupied numbers.
- (3) Processing time as well as influence to tact time in programming (ladder).

1.3 Components and applicable units

The construction of components of CC-Link system that can be used by the Processor Z4-C001 and applicable units are indicated by the following.

The Processor cannot be connected to other units.

	Sequencer CPU unit	CC-Link Master unit
	The applicable CPU units are different by Master unit. Refer to the manual	- AJ61BT11/ A1SJ61BT11/ AJ61QBT11/ A1SJ61QBT11 (After 9707B is indicated in DATE)
	of Master unit showed on the right column.	- QJ61BT11 / QJ61BT11N / LJ61BT11
	Notes	Processor External Power
	- this product cannot be used with the safe	Z4-C001 Cinit (24VDC)
	CPU(QS001CPU).	
	- When the duplexing CPU(QnPRH CPU) is used, this product cannot be attached to the Base	
	unit.	Cable
	- When confirm about the combination of the CPU unit and the Base unit, refer to the manual of Mitsubishi Electric corp for MELSEC-Q CPU.	Z7-A005-PU Z7-A006-PU
		Read/Write head
*1 : Da	ata carrier specification	Z3-A010-CN
11	2 byte type: ISO 15693 based Memory type, EEPBOM	
	Memory capacity 112byte(56word)	
	Writing 100,000 times/reading L	Inlimited Data carrier
2k	(byte type: ISO 15693 based	Z1 series
	Memory type FRAM	
	Memory capacity 2000byte(1000v	vord)

Writing 10 billion times/reading Unlimited

2.1 Specification

Type code	Z4-C00	Z4-C001						
Power supply	24V DC ± 10%							
Current consumption	0.8 A).8 A						
CC-Link version	Ver. 1.10	C						
Sort of CC-Link station	Remote	device station						
Occupied station	4 statior	ns (RX/RY each 128	B, RWr / RWw eac	h 16 words)				
Applicabel R/W head	Z3-A01(D-CN						
Connection to Read/Write head	D-sub 9	pin connector						
Cable length R/W heads	5m stan	dard (max.25m)						
Number of connectable r/w head	2							
Applicable Data carrier	2K byte: 1 112 byte	Z1-AA04-02K : Z1-CB16-112, Z1-CE	327-112, Z1-CB45-	112, Z1-BB10-112	.Z1-B011-128			
* Communicating data								
Communicating address range (word address)								
Data amount per 1 communica with master unit	ation	CH1 Using only 1cl CH1,CH2 Using bo	n : 1 12 words、 oth 2 channel : 1	. 5 words				
ID Data amount per 1 commun with head and Data carrier	nication	ation 11000words						
		ari O polo terminal bl	ook (NOE Tightoi	ng targua 0 E0	0.00 N m)			
Terminal blocks	CC-L	CC-Link: 4 pole terminal block (M3.5, Tightning torque 0.98 … 1.37 N.m)						
Suitable cable outer diameter (mm	12) 0.75	2) 0.75 2.00mm ²						
Suitable crimping terminal	RAV	RAV1.25-3,RAV2-3.5 (JIS C 2805)						
Mounting screw for unit	=>N	=>M4 x 0.7mm x 16mm (tightening torge :781.18N·cm)						
Dimensions	174	$(W) \times 100(H) \times 45($	D)					
Operating temperature, humidity	0	.+55℃, 3590%R	H (not in dew cond	densation)				
Storage temperature, humidity -20+75°C, 3590%RH (not in dew condensation)								
		Frequency	Acceleration	Amplitude	Sweepage			
Vibration rating		10 ~ 57Hz	—	0.075mm	10 times			
		57~150HZ	1G	—	loctave/lmin.*			
Shock rating	10G	10G, 3 times to each axis XYZ						
Noise durability	Not 800 nois 25	to cause malfunctio IV P-P, e width 1 micro S to .60Hz.	n with noise simul external power ur	ator that has nois nit DC24V noise fi	e voltage requency			
Operating atmosphere	With	Without corrosive gas, heavy dust						
Weight	appr	ox. 800g						

* 1 octave ...Initial frequency increases to double or decreases to half.

All the following change is also 1 octave. (10Hz \rightarrow 20Hz, 20Hz \rightarrow 40Hz, 40Hz \rightarrow 20Hz, 20Hz \rightarrow 10Hz)

* [Note] Read/write command can be available up to 1000words (3E8H)

If larger command than memory capacity is given to Data carrier of 112bytes (56 words), Processor will accept and execute it. In that case, read/write function is normally executed within the memory range,

but "Data carrier communication error" has occurred outside of the memory range.

For example, when the command "write to Z1-xxxx-128 (Mifare 56 words) from 0 to 1000 words" is executed.

"Data carrier communication error" happen after writing up to 376 words.

2. 2 Dimension





2. 3 Names of Parts



- ① Terminal block for Power supply
- ② Terminal block for CC-Link
- ③ Connector for R/W head
- ④ Configuration switch(Reference 3.4.1)
- (5) Reset switch (Reference3.4.2)
- 6 LED indication(Reference 3.5)

Describes the installation environment and Handling Precautions in installation of Processor.

3. 1 Procedure of installation



3.2 Processor Installation

3.2.1 Setting condition

Please install Processor avoiding situations where ;

- May be subjected to direct sunlight, such as outdoors.
- Operating temperature exceeds 0..55 degree C.
- Dew condensation caused by severe tempareture change.
- Relative humidity exceeds 35...90%RH.
- Processor is exposed to heavy corrosive gas, combustible gas, or dust.
- Shock or vibration directly to Processor.
- Water, oil or chemical is sprayed on the Processor.

Although this product suits EMC instructions and CE mark is displayed, I am doing the examination in the state of the installation in an operator control panel like the Sequencer.

≪ Attention ≫

Please install Processor in board with particular attention to following points.

- Well ventilated space.
- Processor should not be installed close to devices which generates high heat, such as a heater, transformer or High capacity resistor.
- The surface temperature of Processor may become more than 55 deg.C. by self-fever.

Some measure to install a fan or a heat exchanger should be taken so that the board inside keeps under 55 deg.C.

3.2.2 Processor fixation

The Processor is attached in the mounting hole (ϕ 4.2mm) in a flange using two M4 screws. Tightening torque 0.78...1.18N \cdot m

3. 3 Wiring



① Wiring of an external energizer and FG



- · Connect [+] of 24V DC to terminal indicated [24V DC], [] to terminal indicated [].
- · The FG terminal, please D grounding.
- \cdot Depending on the usage environment, there may be noise coming from the FG line. Please remove the FG terminal in that case.

2 Wiring of CC-Link

Refer to the user's manual for CC-Link system master and local unit.



« Attention »

- The wiring between the CC-Link, please use the dedicated cable CC-Link.
- If you use other cables, the performance of the system can not be guaranteed.
- Dedicated cable CC-Link, prepared by customer.
- Refer to the user's manual for CC-Link system master and local unit.
- "termination resistor" should be connected between DA-DB on both units at the end of CC-Link.
- In connecting termination resistor with DA-DB, use the termination resistor attached to master unit.

Z 5

Υ

VS+ 4

VS- 8

2

③ Wiring of Read/Write head

Reference the following diagram, when wiring the Read/Write head cable to the Processor. There are two connectors CH1 and CH2 for connecting two heads.

[Wiring diagram]

exclusive connector cable

Connector cable : Z7-A005-PU-__ Connector cable : Z7-A006-PU-__

	Pr	ocesso	r Cable	Read/Write head
_	Conn	ector	Cable color	
_	CH1/	7	[Yellow]	A 1
	CH2	9	[Pink]	в 3
		5	[Green]	Z 5
		4	[Gray]	Y 2
		2	[Red]	VS+ 4
		8	[White]	VS- 8
		3	(Shield)	
	Pr	OCESS	r Cable	Read/Write head
	Conn	ector	Cable color	
	CH1/	7	Black	A 1
	CH2	9	Black/White	в 3

Green

Blue

Blue/White

(Shield)

----!

Green/White

exclusive connector cable (Twisted pair cable)

Connector cable : Z7-A005A-PU-__ Connector cable : Z7-A006A-PU-__

Connector Cable color CH1/ 7 CH2 9 5 4 2 Green 8 Black 3 VS-	Processor		r Cable	Read/Write head		Э
CH1/ 7 Blue A 1 CH2 9 White B 3 5 4 Prellow Z 5 4 Brown Y 2 2 Green VS+ 4 8 Black VS- 8	Conn	ector	Cable color			
CH2 9 White B 3 5 4 Yellow Z 5 4 Brown Y 2 2 Green VS+ 4 8 Black VS- 8	CH1/	7	Blue	А	1	
5 Yellow Z 5 4 Brown Y 2 2 Green VS+ 4 8 Black VS- 8	CH2	9	White	В	3	
4 Brown Y 2 2 Green VS+ 4 8 Black VS- 8 3 Ghield Ghield		5	Yellow	Z	5	
2 Green VS+ 4 8 Black VS- 8 3 Shield VS- 8		4	Brown	Υ	2	
8 Black VS- 8		2	Green	VS+	4	
(Shield)		8	Black	VS-	8	
		3	(Shield)			

exclusive connector cable (Robot cable)

Connector cable : Z7-A005A-RB-__ Connector cable : Z7-A006A-RB-__

« Attention »

- Cable of Read/Write head should be kept apart from other power cable and high voltage machines.

- When installing Read/Write heads on a metal frame, the frame should be grounded to the protective ground conductor.

5

4

2

8

3

3.4 Capabilities and configuration of the switch

3.4.1 Configuration switch

Parts	Description					
Setting switch for station	The second digit of	10	Switch No.			
(STATION NO.)			40	20		
	20					
	30		OFF			
	40			OFF	OFF	-
	50		ON	OFF	ON	
	60		ON	ON	OFF	-
			Swi	tch No	•	
	The first digit of station	ו 8	4	2	1	
	0	OFF	OFF	OFF	OF	F
		OFF	OFF	OFF		
	2	OFF	OFF	ON	OFI	F
	3	OFF	OFF	ON	ON	J
	4	OFF	ON	OFF	OFI	
	5	OFF	ON	OFF	- ON	l
	6	OFF	ON	ON	OFI	=
	7	OFF	ON	ON	NO	J
	8	ON	OFF	OFF	OF	F
	9	ON	OFF	OFF	ON	J
Setting switch for transmitting rate of data link (B RATE)	Transmission rate of data link 156k bps 625k bps 2.5M bps 5M bps 10M bps	4 OFF OFF OFF OFF ON	Swi ((tch No. 2 DFF DFF ON ON ON DFF	1 OFF ON OFF ON OFF	
Setting switch for write protection (BLOCK NO.) ※ for CH1, CH2	When a write command includer occurs. Write protection can be set p Setting 16 nil O page OFI O 1 page OFI O 2 page OFI O 3 page	les the area er "page" ar 8 8 7 OFF 7 OFF 7 OFF 7 OFF 7 OFF 7 ON	a that is writed details and d	te protecte re shown a OFF OFF ON OFF OFF	ed,a write as below; 1 OFF ON OFF OFF OFF	protection

3.4.2 Reset switch

Reset switch R (RST) (I	Reset switch for hardware (Please push by using something long and slender stick.) <operation after="" resetting=""> - Initialize remote register - Request of processing initial data will be ON - Renewal setting data of each setting switch</operation>
----------------------------	---

3.5 LED indication

Name	of parts	Description				
PW		Light on : Power ON				
		Light off : Power OFF				
RUN		Light on : Operating normally				
		Light off : Cut off power 24V DC,or WDT error				
L RU	N	Light on : Communicating normally				
		Light off : Cut off communicating (time over error)				
SD		Light on while sending data				
RD		Light on while receiving data				
L ERI	R.	Light on : Communicating data error (CRC error), station number,				
		setting switch for transmitting rate of data link error				
		Blink regular interval				
		when setting switch for station number or transmitting rate of				
		data link is changed while power is supplied.				
		Blink irregular interval				
		terminal resistor is not connected or unit or cable for CC-Link				
		is influenced by noise.				
		Light off : Communicating normally				
CH1	SD	Light on : while sending Read/Write head CH1				
	RD	Light on : while receiving Read/Write head CH1				
	ID-ERR.	Light on : wrong condition Read/Write head CH1				
		when setting switch for block no. is out of set range				
		Blinking : when setting switch for block no. is changed (in set range)				
		Light off : normal condition				
	IN-Z	Light on : when detects inzone ※				
		Light off : cable breakage of Read/Write head				
CH2	SD	Light on : while sending Read/Write head CH2				
RD		Light on : while receiving Read/Write head CH2				
ID-ERR.		Light on : wrong condition Read/Write head CH2				
		when setting switch for block no. is out of set range				
		Blinking : when setting switch for block no. is changed (in set range)				
		Light off : normal condition				
	IN-Z	Light on : when detects inzone				
		Light off : cable breakage of Read/Write head				

 $\ensuremath{\mathscr{K}}$ The state which is present in the domain to which Data carrier can communicate

4.1 Communicating Function

The following functions can be performed with the Processor (Z4-C001).

Functions	Instructions &	Instruction cod		Process	Reference
	Commands	ASCII	Hex.		
Reading	Reading	RD CR	4452H 5243H	Reads data from Data carrier. Compares data to confirmation.	5.7.1
	Sequential Reading	AR SR	5241H 5253H	Executes reading in sequence until Data carrier gets into communication area, and then executes reading.	5.7.2
WritingWD4457HWrites data to Data carrieCW5743HCompares data to check.		Writes data to Data carrier. Compares data to check.	5.7.3		
	Sequential Writing	Sequential NritingAW5741HExecutes writing in sequence until DataSW5753Hgets into communication area, and then ex writing.		Executes writing in sequence until Data carrier gets into communication area, and then executes writing.	5.7.4
	Batch writing	FI	4946H	Writes specified data to specified area in Data carrier	5.7.5
Check	Comparing	СМ	4D43H	Compares data of Processor with data in data carrie	
Clearance	Clearing	CL	4C43H	Clears specified area in Data carrier with "O"	5.7.7
Command	Stop Sequenc instruction			Cancels sequence instruction compulsively.	5.7.8
	Error cancellation			Executes error canceling process. (Clearing error LED, resetting error detected signal,Clearing executing result store area in remote resis	5.7.9

4.2 Memory Address of Data carrier

The memory of the Data carrier has both address in byte(8 bits) and word (16 bits = 2 bytes), and it is composed of a block is unit of 16 bytes(=8 words).

The memory of the Data carrier has both address in byte(8 bits) and word (16 bits = 2 bytes), and it is composed of a block is unit of 16 bytes(=8 words).

It is recommended to use the word in data processing, even if in PLC and PC mixed system for compatibility of data.

(1) Addrooo	appatruction	of Doto	oorrior	"momory"
(I)AUUIESS	CONSTRUCTION	UI Dala	Carrier	пепол

			_
Block	Word addr	ess (Hex.)	
(Page)	START	END	
0	0	7	
1	8	F	
2	10	17	
3	18	1F	
4	20	27	
5	28	2F	
6	30	37	_ 112byte type
	(omission)		(EEPROM) is so far.
122	3D0	3D7	1
123	3D8	3DF	
124	3E0	3E7	

(2) Data store format of Data carrier "memory"



4. 3 Input-Output Signal

Input-output signal (RX, RY) to the master unit of Processor (Z4-C001) is explained in this chapter. Device [RX] is the input signal from the Processor to the master unit and Device [RY] is the output signal from the master unit to the Processor.

4.3.1 Input-Output Signal list

Signal direction : from Processor to master unit			Signal direction : from master unit to Processor			
Device N	o. (input)	Signala	Device No	. (Output)	Signala	
CH1 CH2		SIGLIDIS	CH1	CH2	Signais	
RXn0	RXn8	not use	RY	'n0	Selecting initial setting	
RXn 1	RXn9	Comparing result signal	RY	'nl	Selecting processing unit	
RXn2	RXnA	Inzone	RY	'n2	Selecting number of channel	
RXn3	RXnB	ID-BUSY	RYn3	RYnB	not use	
RXn4	RXnC	Identification instruction completed	RYn4	RYnC	Require executing identification instruction	
RXn5	RXnD	Error detection	RYn5	RYnD	not use	
RXn6	RXnE	not use	RYn6	RYnE	not use	
RXn7	RXnF	Require divided data	Require divided data RYn7 R		Divided data completed	
$RY(n+1)O_{c}$	$RX(n\pm 6)E$	not uso	RYn8 -	~ RYnA	not use	
пл(IIт I)0 ·	° NA(II+0)F	notuse	$RY(n+1)0 \sim RY(n+6)F$		not use	
RX(n+7)0 -	~ RX(n+7)7	not use	$RY(n+7)0 \sim RY(n+7)7$		not use	
RX(n+7)8		Flag for requiring to process initial data	RY(n+7)8		Flag for finishing to process initial data	
RX(n+7)9		Flag for finishing to set initial data	RY(n	+7)9	Flag for requiring to set initial data	
RX(n	+7)A	not use				
RX(n	+7)B	Remote READY	RY(n+7)A	\sim RY(n+7)F	not use	
RX(n+7)C	~ RX(n+7)F	not use				

Input-output signals of Processor (Z4-C001) are indicated in the following table.

n : Address that was allocated to the master station with setting station number.

≪ Attention ≫

- The devices that indicated as "Unavailable" should not be used by user as they are used in the system.

If any "Unavailable" device is used by the user, normal operation would not be warranted.

4.3.2 Input-Output Signal details

Details of Input-Output signals of processor (Z4-C001) is indicated in the following table.

(1) Remote Input (RX)

Device N	0				
CH1	CH2	Signals	Contents		
RXn1	RXn9	Comparing result signal	ON when comparing result is in agreement after reading, writing or comparing (CR,SR,CW,SW,CM). It will be cleared with resetting of RYn4,RYnC, latch the other setting with SET instruction when the comparing result is needed to retain.		
RXn2	RXnA	Inzone	ON while inzone has been detected in executing sequence instruction (AR,SR,AW,SW).		
RXn3	RXnB	ID-BUSY	ON when instruction is executing, and OFF when the instruction is finished executing.		
RXn4	RXnC	Finish identification instruction	ON after instruction is executed, and finished executing instruction normally. It remains OFF when executing instruction is stopped with sequence instruction cancellation while executing sequence instruction (AR,SR,AW,SW). When error is occurred, it won't be ON, and error detection signal (Xn5,XnD) will be ON. Require executing Identification instruction or special instruction ID-BUSY		
RXn5	RXnD	Error detection	OFF when require executing identification instruction (RYn4,RYnC) is OFF. Error cancel instruction Require executing identification instruction or special instruction Error detection Executing error cancel Error occur Executing error cancel		
RXn6	RXnE	Unused	Unused		
RXn7	RXnF	Require divided data	ON flag for requiring divided data to require next data when treating data exceeds certain quantity (using 1 channel : 12 words, 2 channel : 5 words). Executes reading or writing when require divided data flag is ON. ON finish divided data flag when executing read or write data. After that, require divided data flag will be OFF, then finish divided data flag. Require divided data Finish divided data		

4. Communicating Function

BAPLUS Processor Z4-C001

Device No. CH1	CH2	Signal	Contents
RX(n+1)0	RX(n+4)0	Unused	Unused
 RX(n+3)F	 RX(n+6)F		
RX(n+7)8		Flag for requiring to process initial data	ON, OFF timing of requiring to process initial data, finishing to process, finishing to set, and requiring to set are indicated as follows. Flag for requiring to process initial data RX(n+7)8 Flag for finishing to process initial data RY(n+7)8
RX(n+7)9		Flag for finishing to set initial data	Flag for finishing to set initial data RX(n+7)9 Flag for requiring to set initial data RY(n+7)9 Remote READY RX(n+7)B Execute initializing $\frac{1}{\sqrt{2}}$ Execute by sequence program < Executed by processor
RX(n+7)B		Remote READY	ON when processor finished setting of initial data and became ready after power is on or resetting of hardware.

⁽²⁾ Remote output (RY)

Device No CH1	р. СН2	Signals	Contents	
RYn0		Selecting initial setting Specify processing unit or number of channel to use wi setting" or "factory setting". By selecting "user setting", p unit, number of using channel could be selected by OFF : User setting ON : Factory setting (Setting contents : word unit, both of CH1,CH2 are		
RYn1		Selecting processing unit	Specify processing unit of processing data. Setting is effective when select initial setting (RYn0) is OFF (user setting). It is only word unit setting. OFF : word unit ON : unused (to set ON, it will be word unit.)	
RYn2		Selecting number of channel	Specify number of channel to use. Setting is effective when selecting initial setting (RYn0) is OFF (user setting). OFF : both of CH1,CH2 are used ON : only CH1 is used	
RYn4	RYnC	Require executing ID instruction	Executes instruction when require executing identification instruction is ON.	
RYn5	RYnD	Unused	Unused	
RYn6	RYnE	Unused	Unused	
RYn7	RYnF	Finish divided data	Refer to RXn7, RXnF.	
RY(n+1)0		Unused	Unused	
 RY(n+6)F				
RY(n+7)8		Flag for finishing to process initial data	Refer to RX(n+7)8, RX(n+7)9.	
RY(n+7)9		Flag for requiring to set initial data		

4. 4 Remote Register allocation

Allocation for remote resistor of Processor (Z4-C001) is explained in this chapter.

"[RWw] is the remote register for the write data from the master station to the Processor.

 $[\mathsf{RWr}]$ is the remote register for the read data from the Processor to the master station. "

The remote register has no battery for back-up.

Since the remote resistor is set default value when power is supplied or Sequencer CPU is reset,

it is necessary to write your setup data and changed data at every time.

4.4.1 Remote Resistor list

Remote resistor of Processor (Z4-C001) is indicated in the following table.

Using	Direction of	Address		Contents	Reference
channel	receiving	СН1	CH2		
Both of	Writing area	RWwm	RWwm+8	Specifying area for instruction code	4.4.2(1)
using	master station	RWwm+1	RWwm+9	Specifying area for first address	4.4.2(2)
	1	RWwm+2	RWwm+A	Specifying area for processing number	4.4.2(3)
	Processor	RWwm+3	RWwm+B	Specifying area for writing data 1	4.4.2(4)
	110000001			Specifying area for writing data 5	
		RWwm+7	RWwm+F		
	Processor	RWrn	RWrn+8	Storing area for instruction code result	4.4.2(5)
	↓	RWrn+1	RWrn+9	Storing area for executing result	4.4.2(6)
	Reading area	RWrn+2	RWrn+A	not use	
	master station	RWrn+3	RWrn+B	Storing area for reading data 1	4.4.2(7)
		RWrn+7	RWrn+F	Storing area for reading data 5	
Using	Writing area	RWwm		not use	
only CH1	master station	RWwm+1]	Specifying area for instruction code	4.4.2(1)
	↓	RWwm+2		Specifying area for first address	4.4.2(2)
	Processor	RWwm+3		Specifying area for processing number	4.4.2(3)
		RWwm+4		Specifying area for writing data 1	4.4.2(4)
		RWwm+F		Specifying area for writing data 12	
	Processor	RWrn		not use	
	↓	RWrn+1		Storing area for instruction code result	4.4.2(5)
	Reading area	RWrn+2		Storing area for executing result	4.4.2(6)
	master station	RWrn+3		not use	
		RWrn+4		Storing area for reading data 1	4.4.2(7)
		RWrn+F		Storing area for reading data 12	
Initial	Writing area	RWwm	RWwm+8	Specifying area for retry count	4.4.2(8)
setting*	master station	RWwm+1	RWwm+9	Specifying area for inzone detecting time	4.4.2(9)
	↓	RWwm+2	RWwm+A	Specifying area for interval of	4.4.2(10)
	Processor			executing sequence instruction	
		RWwm+3	RWwm+B	not use	
		RWwm+7	RWwm+F		

m,n : Address that was allocated to master station with station number setting

*Valid only when the initial setting select (RYnO) is OFF (user setting).

≪ Attention ≫

- The remote register that indicated "Unavailable" should not be used by the user because they are used in the system.
- If unavailable remote resistor is used by the user, normal operation would not be warranted.

4.4.2 Remote Resistor details

(1) Specifying area for instruction code : Specifies instruction to Data carrier.

[ex.] Specifying reading instruction (RD) (using 2 channels) Replaces upper byte and lower byte, and converts it to ASCII code then stores the code.



Ex.1 Specify ASCII code directly



Head I/O number of master unit

Ex.2 Change with ASC instruction



Head I/O number of master unit

(2) Specifying area for the first address Specify the first address of data carrier memory to read or write data.

Specifying range : 0 ... 999 (0H ... 3E7H) Initial value : 0

[ex.] Specify address 120



<Attention> Specify within the following range.

First address + Processing numbers =< 1000 (3E8H)

When the specified address of processing exceed the memory capacity of the data carrier, reading or writing process is executed within memory and then display "data carrier communication error". (3) Specifying area for processing number Specify processing number of data to be read or written.

Specifying range : 1 ... 1000(1H ... 3E8H) Initial value : 1

[ex.] Specify processing number to be 32

Processing number (read/write)



Store into specifying area for processing number

Head I/O number of master unit



(4) Specifying area for writing data

Specify data to be written into data carrier.

[ex.] Specify contents of D100...D104 to writing data (selected 2 channels).





- (5) Storing area for instruction code result Stores instruction code that executed to processor (BIS M-689-001/001X).
- (6) Storing area for executing result Stores error code.
- (7) Storing area for reading data Stores reading data from data carrier.

(8) Specifying area for retry count (effective in initial setting only) Specify retry time that processor BIS M-689-001/001X executes instruction when error occurs in data communication.

Specifying range : 0 ... 32767 (0 ... 32767 times) ... If the specified number exceeds 32767, the retry time would be 32767 times.

Initial value : 3

[ex.] Specify retry time to be 5



Head I/O number of master unit

- (9) Specifying area for inzone detecting time (valid in initial setting only)
 - Specifies standby time per 10ms when the data carrier gets into communication area to inzone detection

inzone detecting time

(starting communication) in executing sequence instruction.

Specifying range : 0 ... 32767 (0 ... 327670 ms) ... if the specified number exceeds 32767, inzone detection time would be 327670ms

Initial value : 0

[ex.] Specify inzone detecting time to be 2 sec.

Inzone detecting time is;

Standby time since data carrier getting into communication area until starting communication. By specifying this setting, it can communicate with avoiding unstable range. (10) Specifying area for interval of executing sequence instruction (effective in initial setting only) Specify executing instruction interval of sequence instruction per 100ms.

Specifying range : 0 ... 32767 (0ms ... 3276700ms) ... if the specified number exceeds 32767, executing interval would be 3276700ms

Initial value : 0

[ex.] Specify executing interval of sequence instruction to be 5 sec. (5000ms)



4. 5 Data processing time

Processing time for read and write data is indicated in following table.

< Data carrier EEPROM 112byte>

Data	volumo	Processing time		
Data	volume	Reading	Writing	
1 word	2 byte	0.1sec	0.1sec	
32 word	64 byte	0.3sec	0.4sec	
50 word	100 byte	0.4sec	0.6sec	
56 word	112 byte	0.4sec	0.7sec	

< Data carrier FRAM 2000byte>

Dotay	volumo	Processing time		
Data	Joiume	Reading	Writing	
1 word	2 byte	0.1sec	0.1sec	
32 word	64 byte	0.2sec	0.2sec	
50 word	100 byte	0.4sec	0.4sec	
250 word	500 byte	1.8sec	1.9sec	
500 word	1000 byte	3.5sec	3.9sec	
750 word	1500 byte	5.1sec	5.7sec	
1000 word	2000 byte	6.8sec	7.7sec	

« Attention »

-Processing time is the time that processing takes for each data consecutively.

-Processing time is the time since "request communication" turns "ON" until "finish ID instruction" turns "ON". -Measureing conditions: connect 1 Processor (occupied 4 stations) to master unit, with Read/Write heads on 2 channels.

It is including link scan time-and time delay of transmission.

Refer to user's manual for master local unit on the detail of link scan time, time delay of transmission.



5. 1 Features that you should know before programming

5.1.1 Data structure (Processing unit)

Processing data of identification system is carried out with word unit. It is recommended to use the word in data processing, even if in PLC and PC mixed system for compatibility of data.

≪ Attention ≫

Selecting a processing unit for a Initializing instruction (RYn1) should be OFF in this system.

(1) Data flow chart per word unit



5.1.2 Faulty Condition of Data Link

The following table shows condition of Processor Z4-C001 and communication with Data carrier when the data link is in a fault condition.

(1) Condition of Processor

	State of Processor							
Data link	Remote input	Remote output	Remote	Pomoto reciptor(D)//r)				
	(RX)	(RY)	resistor(RWw)	Heriole resistor (HWI)				
When Sequencer CPU								
(Data link continuation)	Continuation	All OFF	Continuation	Continuation				
When Sequencer CPU is reset When Sequencer CPU occurs error When Processor released data link (Data link stop)	Continuation*1	All OFF	Hold	Continuation ¹				

* 1 Since data link has been stopped, data will not be transmitted to master station.

(2) Condition of communication with Data carrier

	Condition of communication with Data carrier								
	Uncommunicating		Executing c	ommunication	Divided sending or				
Data link	oncomm	anicating		ommunication	receiving	condition			
	Normal	Sequence	Normal	Sequence	Normal	Sequence			
	instruction	Instruction	instruction	Instruction	instruction	Instruction			
When Sequencer CPU									
of master station has	Ctop	Stop	* 2	* 3	Stop	Stop			
been stopped	Stop	Stop							
(Data link continuation)									
When Sequencer CPU is									
reset When Sequencer									
CPUoccurs error When	Ston	Stop	* 0	* 0	Stop	Ston			
Processor released data	Otop	Stop	* 2	* 0	Stop	Otop			
link (Data link stop)									

*2 Stop after communication with Data carrier is completed. *3 Stop after outzone is detected.

5.1.3 Notes at the time of programming

Refer to following notes in using this Processor to communicate with Data carrier before creating programs.

(1) For handshake with Sequencer CPU

Input-Output signal is a signal used for the handshakes at the time of performing ID command from a sequence program, or the time of completing ID command.

Please be sure to handshake.

(2) Reading and writing the remote register

Sequence program to read or write the remote register is necessary to communicate with Data carrier.

Create a sequence program for needed process.

Remote register is not taken battery back up It needs to write set or changed data every time because all data return to default value when power is supplied, operated reset, or changed mode.

(3) Condition of retaining data in Data carrier when error occurred

Data is rewritten per 8 words with new data and old data mixed when error occurred while communicating with Data carrier.

Execute instruction again after error cancellation as measure to this condition when error occurred while executing writing instruction (WD,CW,AW,SW,FI).

0

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(4) Notes for divided reading and writing

It should be done per 5 words (using both of CH1, CH2)12 words (using only 1CH) in storing divided data to data register in using instruction indicated below. When unused register (does not store communication data) occurred in allocated data register at this time, the register would be unsettled in reading, unused in writing.

Objective instruction : RD,CR,AR,SR,WD,CW,AW,SW,CM

[ex.]

using both of CH 1, CH 2 The first address for reading and writing to Data carrier Number of words for reading and writing to Data carrier

Allocation data of Sequencer CPU to resistor D0...D9



5. 2 System be used in this Chapter

The example of the sequence program that is explained in this chapter applies to the following system. Refer to user's manual for CC-Link master unit (detail) on sequence program of whole CC-Link system.

(1) Construction of system in programming example



(2) Relation of Sequencer CPU, Buffer memory of master unit and remote device station



* For QCPU(Q mode),QnACPU

When using ACPU : it will be RX :M200...M327, RY:M328...M355

5. 3 Sequence Program for ACPU

The sequence program in this chapter has shown the sequence program for QCPU(Q mode) or QnASPU, as long as there are no notes.

When using this program for ACPU the sequence, replace the following contacts for QCPU(Q mode) or QnACPU to ACPU.

(1) Replace of relay

QCPU(Qmode)/		ACPU	Contents
QnACPU			
SM400	\rightarrow	M9036	always ON
SM401		M9037	always OFF
SM402		M9038	after RUN, ON only 1 scan
SM403		M9039	after RUN, OFF only 1 scan

(2) Setting of RX, RY

Regards in using for ACPU that RX and RY varies ; RX : M200...M327, RY : M328...M355.

5. 4 Basic Format of Program

The followings are basic format of program. Programs are created as following order. Refer to 5.2 on program condition.



(1) Initial setting of master unit

Creates program to stand data link with CC-Link refresh command after setting of parameter. [ex.] Number of connecting station : 1

Connecting station : Z4-C001(station number 1, occupies 4 stations)



<Attention> Program (a), (b) is not needed when CC-Link parameter is set with GX Developer in using QCPU (Q mode) or QnACPU. (a) Setting of the number of connecting stations (buffer memory address of master unit : 1H) Set the number of stations to be connected to master unit such as remote I/O station, remote devic e

station, intelligent device station, local station (including reserve station).

(b) Setting of station information

(buffer memory address of master unit : the first station(20H)...64th station(5FH))

Set the type of stations to be connected to master unit such as remote I/O station, remote device station, intelligent device station, local station.

Needed to set for all number of connecting stations.



Station number 30(1EH) Number of occupied station (Processor occupies 4 stations) Station type (Processor is remote device station)

(2) Reading data link condition of processor, remote input (RX) Create program to interlock after detecting data link condition of processor. Read RXn0...RX(n+7)F out to M200~M327(M208~M335).

M9036	(SM400)	FROM	но	H680	K4M100	K4	거	Reading data link condition of processor
	1	FROM	HO	HOEO	K4M200 (K4M208)	K 8		Read RXn0RX(n+7)F out to M200M327 (M208~M335)

* Example of sequence program for ACPU. Digits for QCPU (Q mode), QnACPU are indicated in ().

<attention></attention>
Delete the sequence program indicated within above dashed line, when the following setting is set.
*Using QJ61BT11,AJ61QBT11,A1SJ61QBT11
Set automatic refresh parameter with GX Developer
*Using AJ61BT11,A1SJ61BT11
Set automatic refresh with instruction for CC-Link

(3) Initial setting of processor

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Create the program to execute initial setting of processor (Refer to 5.6).

(4) Communication instruction

Create the program to execute identification communication instruction (Refer to 5.7.1...5.7.9).



(5) Writing to remote output (RY) Create the following program and write M328...M455(M336...M463) to RYn0...RY(n+7)F.

- ∗	H9036 (SH400) 	ce program for ACPL	⊑™ но J. Digits for (H160 K4M328 (K4M336) QCPU (Q mode	, K8 	rite M328M455 to RYn0RY(n+7)F (M336M463) are indicated in ().
	<attention> Delete the se *Using QJ61 Set automat *Using AJ61 Set automat</attention>	equence program in a BT11,AJ61QBT11,A1 ic refresh parameter 3T11,A1SJ61BT11 ic refresh with instrue	above chart SJ61QBT11 with GX Dev ction for CC-	when the follov veloper Link	ving setting is	set .
5.5	Processing progra Reference the ch	m when fault condition	on occurred a program fo	r fault conditior	15.	
	Init (pa	ial setting program arameter setting, da	of master u ta link settii	unit ng)		
-	M9036(SM40	0)	-[FROM I	H0 H680 K41	м100 <u>к4</u> —	Reading data link condition
			-[FROM	H0 H0E0 K4 (K4I	M200 K <u>8</u> M208)	Reading RX information
	M100		- Prc	[RST M3 (M34 [RST M1 ocessing prog	32(RY4)]	Create processing program as refer to left chapter. M332 (M340) : Relay of request of identification instruction M1: External relay of request of identification instruction
	ldentifi	ication communicat	ion instructi	on program		
-	M9036(SM40	0) sequence program fo		H160 K4M3 (K4M its for QCPU (6	328 K8 1336) Q mode), Qn/	Writing RY information
	<attention> Reset request of fault is occurred The instruction starting identified</attention>	of identification instruct ed. is executed again after ication instruction is r	ion to avoid the recovery of the recovery of the reset.	unexpected con	nmunication in e of external c	program when ontact (M1) for

5.6 Initial setting

Following initial setting is needed to communicate with data carrier.

"The initial setting can be set only when the initial data request(RX78) is ON. In order to change initial setting, it is necessary to change a program, and to return on the Processor, or to reset it."

The writing to the remote register of initial setting should be performed just once at startup of the Processor.

(1) Initial setting with factory setting

(a) In using ACPU

* Regard that the following example shows RX : M200...M327, RY : M328...M455.



(b) In using QnACPU

Automatic refresh parameter is set with GX Developer as followings.

* Regard that the following example shows refresh range RX : M208...M335, RY : M336...M463

1. Setting with GX Developer

 Start I/O No. 	0000
 Type 	: Master station
All connect count	: 1
Remote input (RX)	: M208
Remote output (RY)	: M336
Remote register (RWr)	: D200
Remote register (RWw)	: D100
Special relay (SB)	: -
Special register (SW)	: -
Retry count	: 3
Automatic connection station count	: 1
 Standby master station number 	: 0
PLC down select	: Stop
 Scan mode setting 	: asynchronous
 Delay information setting 	: 0
 Station information setting 	: station information

Station information setting • Set the station information according to the system constitution. For more information, refer to the manual of the master unit.

2. Program



(c) In using QCPU (Q mode)

Automatic refresh parameter and initial setting are set with GX Developer as followings.

* Regard that the following example shows refresh range RX : M208...M335, RY : M336...M463

1. Setting with GX Developer

<Automatic refresh parameter>

: 0000
: -
: Master station
: PLC parameter auto start · Mode setting
: Online (Remote net mode)
: 1
: M208
: M336
: D200
: D100
: SBO
: SWO
: 3
: 1
:0
: Stop
: Asynchronous
:0
: Station information
: Initial setting
: -

< Initial setting >

Execute	Operating	Condition c	of executing	g procedure	Conte]		
flag	condition	Condition device	Device numbe	executing condition	Writing device	Device number	Writing data	
Execute	Set new	RX	78	ON	RY	00	ON	Factory setting
Execute	Same as prev. set	RX	78	ON	RY	78	ON	
Execute	Same as prev. set	RX	78	ON	RY	79	ON	"Initial data
Execute	Set new	RX	78	OFF	RY	78	OFF	/installation"
Execute	Set new	RX	79	ON	RY	79	OFF	

2 Program

SM400	FROM	но	H680 K4M100	к 4]-	Reading other data link condition
(RX78) (link) M213 SB5F (RX5)	FROMP	HO	ESET	SBOD]- K1]-	Specify registering of initial procedure Reading error code of setting dip switch
			RST	SBOD	OFF registering of initial procedure



(2) Initial setting by user

Also assumed that both examples, such as the following to configure user settings.

- · Processing unit : Word unit
- · Number of Channels : CH1,CH2 When using both
- CH1 · Number of retries : 5 times
 - · Detection time in zone : 2 seconds(2000ms)
 - · Continuation command execution interval : 5seconds(5000ms)
- CH2 · Number of retries : 5 times
 - · Detection time in zone : 2 seconds(2000ms)
 - · Continuation command execution interval : 5seconds(5000ms)

M0036							Reading other data link condition
	FROM	HO	H680	K4M100	K4	₽	Reading input (RX)
H220 H100	FROM	HO	HOEO	K4M200	K 8	Ъ	User setting
				RST	M328	Ъ	Setting processing unit to word
(84/0) (327)				RST	M329	╊	Select number of using channel to 2 channel
				RST	M330	₽	Specify retry count (5 times)
			MOVP	K5	D100	₽	Specify inzone detecting time
			MOVP	K200	D101	₽	Specify interval for executing
			MOVP	K50	D102	₽	sequence instruction (5 sec.
			MOVP	K5	D108	₽	
			MOVP	K200	D109	₽	
			MOVP	K50	D110	Ъ	sequence instruction (5 sec.)
	TO	HO	H1E0	D100	K16	Ъ	Writing
	_			SET	₩448	_ _	ON finish processing initial data
				-	(RY78)) —	ON require setting initial data
M205				SET	M449 (RY79)	Ъ	Reading error code of setting dip switch
M320 (RX78) (RX5)	FROMP	HO	H2E1	RO	K1	Ъ	OFF finish processing initial data
1321 (RX79)				RST	M448 (RY78)	,±,	OFF require setting initial data
N9036				RST	M449	Ŧ	Writing output (RY)
	TO	HO	H160	K4M328	K8	Ŀ	1

(a) In using ACPU



(b) In using QnACPU

Automatic refresh parameter is set with GX Developer as followings. * Regard that the following example shows refresh range RX : M208...M335, RY : M336...M463

1. Setting with GX Developer

Start I/O No.	: 0000
• Type	: Master station
All connect count	: 1
 Remote input (RX) 	: IM208
Remote output (RY)	: M336
Remote register (RWr)	: D200
Remote register (RWw)	: D100
 Special relay (SB) 	:-
 Special register (SW) 	: -
Retry count	: 3
 Automatic reconnection station count 	: 1
PLC down select	: Stop
 Scan mode setting 	: Asynchronous
 Delay information setting 	: 0
 Station information setting 	: Station information



2. Program

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SM400		FROM	HO	H680	K4M100	K4	Э	Reading other data link condition
(BY 79) (IDA)					RST	M336	Н	User setting
(00/0) (929)					RST	M337	Н	Setting processing unit to word
					RST	M338 (RY2)	머	Select number of using channel to 2 channel
				MOVP	K5	D100	머	Specify retry count (5 times)
-				MOVP	K200	D101	머	Specify inzone detecting time
-				MOVP	K50	D102	머	Specify interval for executing
-				MOVP	K5	D108	머	Specify retry count (5 times)
				MOVP	K200	D109	머	Specify inzone detecting time
-				MOVP	K50	D110	머	Specify interval for executing
					SET	M456 (RY78)	거	ON finish processing initial data
	213				SET	M457 (RY79)	거	ON require setting initial data
M328 (RX78) (R	x5)	FROMP	HO	H2E1	RO	K1	머	Reading error code of setting dip switch
M329 (RX79)	,				RST	M456 (RY78)	머	OFF finish processing initial data
-11					RST	M457 (RY79)	Ъ	OFF require setting initial data
I								

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(C) In using QCPU (Q mode)

Setting of automatic refresh parameter, program is the same procedure as initial setting of factory setting (refer to 5.6 (1)(c)). Display for initial setting is as follows.

Input format	decimal								
Executing	Operating	Condition	of executing	procedure	Contents	of executir	ng		
flag	condition	Condition	Device	Executing	Writing	Device	Writing		
Ű		device	number	condition	device	number	data ×		
Execute	Set new	RX	78	ON	RY	00	OFF	User setting	
Execute	Same as prev. set	RX	78	ON	RY	01	OFF	Word unit	
Execute	Same as prev. set	RX	78	ON	RY	02	OFF	Using 2 channels	
Execute	Same as prev. set	RX	78	ON	RWw	00	5	Retry count	٦
Execute	Same as prev. set	RX	78	ON	RWw	01	200	Inzone detecting time	(CH1)
Execute	Same as prev. set	RX	78	ON	RWw	02	50	The interval executing a sequence command	
Execute	Same as prev. set	RX	78	ON	RWw	08	5	Retry count	٦
Execute	Same as prev. set	RX	78	ON	RWw	09	200	Inzone detecting time	(CHS)
Execute	Same as prev. set	RX	78	ON	RWw	0A	50	The interval executing a sequence command	(0112)
Execute	Same as prev. set	RX	78	ON	RY	78	ON	0	-
Execute	Same as prev. set	RX	78	ON	RY	79	ON		
Execute	Set new	RX	78	OFF	RY	78	OFF		
Execute	Set new	RX	79	ON	RY	79	OFF		
Execute	Set new								

* Input form Decimal

5. 7 Communication statement

5.7.1 Reading instruction (RD,CR)

Stores the data read from Data carrier to remote register in Processor. Reads data out again to check data and compares the data.

Instruction code	RD	(4452H)
	CR	(5243H)

(1) Operation timing

The following chart shows operating timing.



(2) Explanation of operating

The following explains the timing operation.



« Attention »

It executes instructions for number of retry times and occures error in the case of the code tag is not present when reading instruction (RD, CR) is executed.

(3) Example of programming

The example is programmed on the following condition. (Comparing result signal (RX1) is not used in the following program.)

Using channel CH1 Instruction code RD (4452H) First reading address of Data carrier...... 10 Number of reading word 10 Store area of reading data D1000...D1009 Store area of error code RO

Exter	nal External			1	
signal			SET	м1 Э	Start
	N100 N221 N211 N212 N240	FROM HO	H680 K4M100	о к4]-	Reading other data link condition
H-1+			MOVP H4452	D100	Setting instruction code
	(IIIIK) (RX1B) (RX3) (RX4) (R14)		MOVP K10	D101]	Setting first address of reading (K10)
			MOVP K10	D102	Setting number of reading word(K10)
		ТОР НО	H1E0 D100	кз 🕂	Writing of setting digit
			SET	M340	Start executing instruction
	M215 M343 M340		Смоль ко	"zö' Τ	Initialization index register
		FROMP HO	H2E3 D10002	Z0 K5]-	Store the reading data to after D1000
			C+P K5	Z0 거	Add K5 to index register
	M215 M343 M340		SET	M343	Set flag for finish divided reading
			RST	M343	Reset flag for finish divided reading
	M212 M340	FROMP HO	H2E3 D10002	zo к5]-	Store the reading data to after D1000
	(RX4) (R14)		RST	M340	Finish executing instruction
	M212 M240		RST	M1 3	Finish
	(RX5) (RY4)		H2E1 R0	к1]-	Reading error code

5.7.2 Sequence Reading Instruction (AR,SR)

Executes reading in sequence until Data carrier gets into communication area . Reads the data when Data carrier gets into communication area and store it to remote register of Processor.

After that, reads data out to check, and compares the data.



(1) Operation timing

The following chart shows operation timing.



(2) Explanation of operation

The following explains operation of the timimg chart.



« Attention »

Sequence reading (AR,SR) executes reading in sequence until Data carrier gets into
 communication area. Reading is executed eternally when Data carrier does not get into

communication area.

- Execute sequence instruction cancellation to stop execution. (Refer to 5.7.8)

(3) Example of programming

The example is programmed on the following condition. (Comparing result signal (RX1) is not used in the following program.)

Using channel	. CH1
Instruction code	AR (5241H)
First reading address of Data carrier	10
Number of reading word	10
Store area of reading data	D1000D1009
Store area of error code	RO

External External		
Signal interlock signal	СSET М1]-	Start
	FROM H0 H680 K4M100 K4	Reading other data link condition
		Setting instruction code
(link) (RX7B) (RX3) (RX4) (R14)	Смоур к10	Setting first address of reading (K10)
	[MOVP K10 D102]-	Setting number of reading word(K10)
	СТОР НО Н1ЕО D100 КЗ]-	Writing of setting digit
	[SET	Start executing instruction
NO15 NO10 NO10	[моvр ко (К14)]-	Initialization index register
	FROMP H0 H2E3 D1000Z0 K5	Store the reading data to after D1000
(RX7) (R17)(R14)	Г+Р к5 z0	Add K5 to index register
N215 N242 N240	[SET M343	Set flag for finish divided reading
(RX7) (RY7) (RY4)	[RST M343]- (RY7)	Reset flag for finish divided reading
M212 M340		Set flag for finish divided reading (Only last)
	[RST M340]+ (RY4)	Finish executing instruction
M213 M240	[RST M1]	Finish
(RX5) (RY4)	FROMP H0 H2E1 R0 K1 -	Reading error code
	· · · · · · · · · · · · · · · · · · ·	

5.7.3 Writing instruction(WD,CW)

Write data that stored in remote register to Data carrier. Stores the data read from Data carrier to remote register in Processor. Reads data out to check data and compares the data after writing.

Instruction code	WD	(4457H)
	CW	(5743H)

(1) Operation timing

The following chart shows operating timing.



(2) Explanation of operating

The following explains operation of the timimg chart.



« Attention »

- When area for writing is including write protection area, write protection error occurs. (It does not execute writing to area except write protection area.)

- It executes instructions for the number of retry times and occurs error in the case of Data carrier is not present when writing instruction (WD, CW) is executed.

(3) Example of programmingThe example is programmed on the following condition.(Comparing result signal (RX1) is not used in the following program.)

Using channel	CH1
Instruction code	WD (4457H)
First writing address of data carrier .	
Number of writing word	10
Store area of writing data	D2000D2009
Store area of error code	R0

External External				
		SET	M1]-	Start
	ROM HO	H680 K4M10	о к4]-	Reading other data link condition
	[MOVP H4457	D100	Setting instruction code
(IINK) (RX7B) (RX3) (RX4) (RY4)	[MOVP K10	D101	Setting first address of writing (K10)
	[MOVP K10	D102	Setting number of writing word(K10)
	BMOVE	P D2000 D103	к5]-	Sets D2000D2004 as writing data
	OP HO	H1E0 D100	кз 🖵	Writing of setting digit
	OP HO	H1E3 D103	к5]-	Write writing data
		SET	M340	Start executing instruction
	[MOVP K5		Initialization index register
	BMOVE	P D2000Z0 D10	з к5]-	Set after D2005 as writing data
	OP HO	H1E3 D103	к5]-	Write writing data
	[+P K5	Z0]-	Add K5 to index register
		SET	M343	Set flag for finish divided reading
M215 M343 M340		RST	(RY7) M343	Reset flag for finish divided reading
(RX7) (RY7) (RY4) M212 M340		Грот		Finish executing instruction
(RX4) (RY4)			(RY4)	Finish
M213 M340		RSI	M1 _	
(RX5) (RY4)	ROMP H0	H2E1 R0	<u>к1</u>	Reading error code
			.	



5.7.4 Sequence Writing Instruction (AW,SW)

Executes writing in sequence until Data carrier gets into communication area . Writes the data that stored in remote register of Processor when Data carrier gets into communication area. For confirmation, we compared reading to verify data after writing.

Instruction code	AW	(5741H)
	SW	(5753H)

(1) Operation timing

The following chart shows operating timing.



(2) Explanation of operating

The following explains operation of the timimg chart.



 \ll Attention \gg

- When a write command includes the area that is write protected, a wirte protection error occures.
- (It does not execute writing to area except write protection area.)

- Sequence writing (AW,SW) executes writing in sequence until Data carrier gets into communication area. Writing is executed eternally when Data carrier does not get into communication area.

- Execute sequence instruction cancellation to stop execution. (Refer to 5.7.8)

(3) Example of programmingThe example is programmed on the following condition.(Comparing result signal (RX1) is not used in the following program.)

Using channel C	H1
Instruction code	AW (5741H)
First writing address of data carrier	10
Number of writing words	10
Store area of writing data	D2000D2009
Store area of error code	R0

External External	
Signal Interlock signal	Start
SM400 FROM H0 H680 K4M100 K4	Reading other data link condition
M1 M100 M331 M211 M212 M340 	Setting instruction code
(link) (RX7B) (RX3) (RX4) (RY4)	Setting first address of writing (K10)
	Setting number of writing word(K10)
BMOVP D2000 D103 K5	Sets D2000D2004 as writing data
СТОР НО Н1ЕО D100 КЗ	Writing of setting digit
TOP H0 H1E3 D103 K5	Write writing data
	Start executing instruction
(RY4) MOVP K5 Z0	Initialization index register
M215 M343 M340 BMOVP D2000Z0 D103 K5	Set after D2005 as writing data
(RX7) (RY7) (RY4) TOP H0 H1E3 D103 K5	Write writing data
[+Р К5 Z0]-	Add K5 to index register
[Set flag for finish divided reading
M215 M343 M340 (RY7) RST M343	Reset flag for finish divided reading
(RX7) (RY7) (RY4) (RY7) M212 M340	Finish executing instruction
RST M340_ (RX4) (RY4) _ (RY4) _	Finish
	Reading error code
│	Reading end code
1	I



5.7.5 Batch Writing Instruction (FI)

Batch writing instruction clears the share of processing data from a specified address with 1-word specifydata.

Use clear instruction (CL) to zero clear all data.

Instruction code

FI (4946H)

(1) Operation timing

The following chrat shows operating timing.

External signal	OFF	
M1	OFFWriting percentator	
Sequence program	ON OFFTOP	
Request of executing ID instruction M340 (RY4)		
Finish of ID instruction M212 (RX4)		,
ID-BUSY M211(RX3)		<u>_</u> 4_
Communication data carrier and read/write head		
Error detection M213 (RX5)	ON OFF	```->

(2) Explanation of operating

The following explains operation of the timimg chart.



≪ Attention ≫

- It executes instructions for the number of retry times and occurs error in the case of

Data carrier is not present when batch writing instruction (FI) is executed.

- When area for writing is including write protection area, write protection error occurs.

(It does not execute writing to area except write protection area.)

(3) Example of programming The example is programmed on the following condition.

Using channel	CH1
Instruction code	FI (4946H)
First writing address of data carrier	10
Number of writing word	10
Store area of writing data	D2000
Store area of error code	R0

External External						
			[SET	M1]	Start
SM400	FROM	HO	H680	K4M10	0 к4]-	Reading other data link condition
M1 M100 M331 M211 M212 M3	40			H4946	D100	Setting instruction code
(Link) (RX7B) (RX3) (RX4) (RY4)				K10	D101	Setting first address of writing (K10)
				K10	D102	Setting number of writing word(K10)
				D2000	D103	Sets D2000 as writing data
	С тор	H0	H1E0	D100	кз 🖵	Writing of setting digit
	ТОР	HO	H1E3	D103	к1	Write writing data
			[\$	SET	M340	Start executing instruction
M212 M340			[F	RST	(RY4) M340	Finish executing instruction
(RX4) (RY4)			[F	RST (RY4) M1	Finish
M213 M340	FROMP	H0	H2E1	R0	 к1	Reading error code
(RAJ) (R14)						



5.7.6 Comparison Instruction (CM)

Comparison instruction (CM) compares data that stores in remote register and data in Data carrier so the compared data can be checked as relay (RX1/RX9).

Instruction	code
110000001	0000

Г

CM (4D43H)

(1) Operation timing

The following chart shows operating timing.

C External signal	ON FF	Л
M1 (ON DFF _	Writing parameter Store data from Store data from
Sequence program	ON OFF_	TOP D2000D2004 TOP D2005D2009
Request of executing ID instruction M340 (RY4)	ON OFF_	L
Finish of ID instruction M212 (RX4)	ON OFF_	
ID-BUSY M211(RX3)	ON OFF_	
Request of divided data M215 (RX7)	ON OFF_	
Finish of divided data M343 (RY7)	ON OFF_	Þ-4,\ (
Communication data carrier and read/write head	OFF_	
Compare accordance M209 (RX1)	ON OFF _	
Processing signal of comparing result M10/M11	ON OFF_	Ļ.
Error detection M213 (RX5)	ON OFF	

(2) Explanation of operating

The following explains operation of the timimg chaet.



« Attention »

- It executes instructions for the number of retry times and occurs error in the case of data carrier is not present when comparison instruction (CM) is executed.

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(3) Example of programming

The example is programmed on the following condition.

Using channel	CH1
Instruction code	CM (4D43H)
First writing address of Data carrier	
Number of writing word	10
Store area of writing data	D2000
Store area of error code	RO

External External Signal interlock signal		
SM400	[SET M1]-	Start
	FROM НО Н680 К4М100 К4]-	Reading other data link condition
	MOVP H4D43 D10	Setting instruction code
(Link) (RX7B) (RX3) (RX4) (RY4)	MOVP K10 D101	Setting first address of comparing (K10)
	MOVP K10 D102	Setting number of comparing word(K10)
		Sets D2000D2004 as comparing data
		Writing of setting digit
		Write comparing data
	SE1	(RY4)
M215 M343 M340	MOVP K5 Z0	Initialization index resistor
	BMOVP D2000Z0 D103 K5	Set after D2005 as comparing data
		Write comparing data
	+P K5 Z0]-	Add K5 to index resistor
	SETM343	Set flag for finish divided reading
(RX7) (RY7) (RY4)	(RY7) RST M343 (RY7)	Reset flag for finish divided reading
M212 M340 M209	[SET M10]-	Processing compare accordance (ON M10)
M209	[SET M11]-	Processing compare unaccordance (ON M11)
		Finish executing instruction
		Finish
(RX5) (RY4)	FROMP Н0 Н2E1 R0 К1]-	Reading error code

5.7.7 Clear Instruction (CL)

Clear instruction (CL) clears data number of processing with "O" from specified address.

Instruction code

CL (4C43H)

(1) Operation timing

The following chart shows operating timing.

(External signal C		
M1 (ON DFF	
Sequence program	ON OFFTOP	
Request of executing ID instruction M340 (RY4)	OFF	L
Finish of ID instruction M212 (RX4)	OFF	,#
ID-BUSY M211(RX3)		(/ 4_
Communication data carrier and read/write head	OFF	₽ <u> </u>
Error detection M213 (RX5)	ON OFF	<u>````</u> `>

(2) Explanation of operating

The following explains the timimg operation.



« Attention »
-It executes instructions for the number of retry times and occurs error in the case of
Data carrier is not present when clear instruction (CL) is executed.
-Clear instruction (CL) clears specified range data with "O". To clear data with specified data,
-use batch writing instruction (FI).
-The area that set write protection is not cleared.
-Write protection error does not occurred.

(3) Example of programming

The example is programmed on the following condition.

Using channel	CH1
Instruction code	CL (4C43H)
First address of Data carrier t	o clear 10
Number of processing words .	
Store area of error code	RO

External External			1	
Signal interlock signal		-	_	
		SET	M1 _H	Start
SM400	_		_	
	FROM H0	H680 K4M100	K4 _ H	Reading other data link condition
M1 M100 M331 M211 M212 M340	_			
		MOVP H4C43	D100	Setting instruction code
(Link) (RX7B) (RX3) (RX4) (RY4)	_		-	-
(ſ	MOVP K10	D101	Specify the first address to clear (K10)
	Г	MOVP K10	D10P	Specify the number of processing words
	L			opeany the number of processing nords
	Птор ил	L1E0 D100	v2 7	Writing of cotting digit
			<u>~</u> ∍_	whichg of setting digit
		Гегт	11210	Chart averaging instruction
N010 N010		261	M340	Start executing instruction
M212 M340			(RY4)	
		RST	M340	Finish executing instruction
(RX4) (RY4)		_ (RY4) _	
		RST	M1 _H	Finish
M213 M340				
	FROMP H0	H2E1 R0	K1 -	Reading error code
(RX5) (RY4)	—		-	-
			I	

5.7.8 Stop Command of Sequence Instruction

Stop command of the sequence instruction stops the sequence instruction (AR,SR,AW,SW)

(1) Example of programming

The example is programmed on the following condition. (Program to stop sequence instructions that is written in this chapter.)

· Using channel······CH1

External External Signal interlock signal SM400 M2 M100 M331 M212 M213 M340 M1 (link) (RX7B) (RX4) (RX5) (RY4) M211 (RX3) M213 (RX5)	[SET M2]- H680 K4M100 K4]- [RST M340]- [RST M1]- [RST M2]-	Start Reading other data link condition Stop sequence instruction Finish sequence instruction Finish instruction
≪ Attention ≫		

-Reset instruction after timer counting in the case of stop command of sequence instruction is executed while the timer of executing interval of sequence instruction is operating.

5.7.9 Error Cancellation Instruction

Error cancellation instruction cancels the error that occurred.

(1) Example of programming

The example is programmed on the following condition.

(Program to cancel error that occurred in using instructions written in this chapter.)

· Using channel······CH1

External External Signal interlock signal			
		[set м2]-	Start
	FROM HO	Н680 К4М100 К4]	Reading other data link condition
			Stop sequence instruction
(link) (RX7B) (RX5) (RY4)			Finish sequence instruction
M213			Finish instruction
(ŔX5)			

Error that occurred in using this controller (Z4-C001) and trouble shooting is explained in this chapter.

6. 1 List of Error Code

Errors that occurred in using this controller (Z4-C001), error, processing procedure are indicated below.

The newest error code is stored in the stored area for executing result.

The following digits are stored in ** of error code.

· All instructions · · · · · ·	00H
· CM 05H	• SW OEH
• RD01H	• CL,FI 06H
·WD02H	· CR OBH
• AR	• CW OCH
• AW04H	· SR ODH

Error code Hex.	Error name	Error contents	LED	Processing procedure
**01H	Number of executing word error	Number of specified address + word exceed 1000 words.		Check "number of address + word" are not exceed the last address (1000)
**03H	Write protect setting switch error	Write Block setting switch exceeds setting range.		Check Write Block setting switch does not exceed setting range.
**11H	Set address error	Setting address exceeds setting range.		Check "address" of sequence program does not exceed setting range of address.
**12H	Number of setting word error	Setting word digit exceeds setting range.	ID-ERR.	Check "word digit" of sequence program does not exceed setting range of word digit.
**13H	Data carrier unpresent error	Data carrier is unpresent in communication area. R/W head cable breakage.		Put Data carrier into communication area. Check wiring of Read/Write head.
**14H	Data carrier communication error	Error occurs while communicating with data carrier		Check communication distance of Data carrier and center off-set.
**16H	Write protection error	Executed writing to write protection area.		Check "address" and "address + communication word digit" are not in write protection area.
**22H	Instruction code	Set instruction code that is not defined		Check instruction code.

6. 2 Trouble Shooting

6.2.1 Confirming Procedure with LED indicator

Confirmation procedure on LED indicator is indicated below. Refer to the following table for the proper procedure.

(1) LED "PW" turns off

	Points to be checked	Procedure
1	Power is supplied or not.	Supply power.
2	Polarity of external power supply is appropriate or not.	Connect polarity of external power supply appropriately
3	Wiring is correct or not.	Check for correct wiring.
(4)	The voltage of external power supply is in the range of specification or not.	Adjust supply voltage per specification.
5	Supply capacity is OK or not.	Calculate current consumption before selecting power unit.
6	The LED does not turn on when power is supplied again after checking these points.	Possible hardware problem. Consult manufacture for details of the fault condition.

(2) LED "RUN" turns off

	Cause	Procedure
1	"PW" LED is on or not.	Check the above procedure (1) LED "PW" turns off.
2	Watch dog timer error occurred.	Reset hardware with reset switch.
3	The LED does not turn on when power is supplied again after checking these points.	Possible hardware problem. Consult manufacture on detail of fault condition.

(3) LED "L RUN" turns off

	Cause	Procedure
1	Watch dog timer error occurred.	Reset hardware with reset switch.
2	Breakage or short circuit of cable.	Repair broken or short circuit cable.
3	Master unit stops link.	Check master unit whether error occurred or not.
(4)	Power is not supplied.	Check the voltage of 24V power unit.
5	Station number is duplicated.	Correct station setting the duplicated units then supply power again or push reset switch.
6	Setting switch (station number, transmitting rate) is out of range.	Correct switch setting (station number, transmitting rate) then supply power again or push reset switch.

(4) LED "L ERR." turns on

	Cause	Procedure
1	Setting switch (station number transmitting rate) is out of range.	Correct switch setting (station number, transmitting rate) then supply power again or push reset switch.

(5)LED "L ERR." blinks at fixed interval

	Cause	Procedure
1	Setting switch (station number, transmitting rate) is changed	Return the setting of switch. Supply power again or push reset switch to set the changed setting.
2	Setting switch (station number, transmitting rate) is faulty.	There might be hardware fault. If the switch setting is not changed. Consult manufacture on details of fault condition.

(6) LED "L ERR." blinks at unsettled interval.

	Cause	Procedure
1	Terminal resistor is not connected.	Check to see if the terminal resistor is connected or not. Connect terminal resistor when it is not connected, then supply power again or push reset switch.
2	Unit or cable for CC-Link is affected by noise.	Ground to the protective ground conductor and both edges of the shield line of cable for CC-Link through SLD of each unit and FG. Ground FG terminal of unit surely. To make wiring in pipe, ground pipe surely.

(7) LED "ID-ERR." turns on

	Cause	Procedure
1	Contents of error code	Confirm contents of error code. Check the sequence of the program, refer to procedure 6.1.
2	Write protection setting switch is changed to out of range.	Reset switch setting in setting range. LED turns off when the setting is returned from former setting. LED blinks when the setting is changed in setting range, but different setting from former. Supply power again or push reset switch to set the changed setting.

(8) LED "ID- ERR." blinks

	Cause	Procedure
1	Write protection setting switch is changed.	Return the switch setting. Supply power again or push reset switch to set the changed setting.
2	It does not settle after checking these points.	Possible hardware problem. Consult manufacture on detail of fault condition.

(9) LED "IN-Z" blinks

	Cause	Procedure
1	Read/Write head is connected correctly.	Check wiring.
2	Wiring has done correctly.	Make the correct wiring. Check cable breakage.
3	It does not settle after checking these points.	Read/Write head might be faulty. Replace the Read/Write head.

6.2.2 Procedure for Fault of Data Link

In the case of LED "ERR." of master unit blinks or, the system cannot transmit correct data in spite of data link, take proper procedure. Refer to the following trouble shooting.





- *1 : Check for short circuit, reversal connection, cable breakage, terminal resistor, FG connection, total Extended distance, and distance between stations.
- *2 : Part of station number setting is duplicated.
- *3 : Station number setting is duplicated completely.



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