

# **MELFA**

Industrial Robots

Instruction Manual

# **CRn-500**

## **Expansion Serial Interface**



## ■ CE マーキング対策部品取付方法説明書

## ■ EMC Installation guideline and procedure

### 増設シリアル通信ケーブルへのフェライトコア取り付け要領

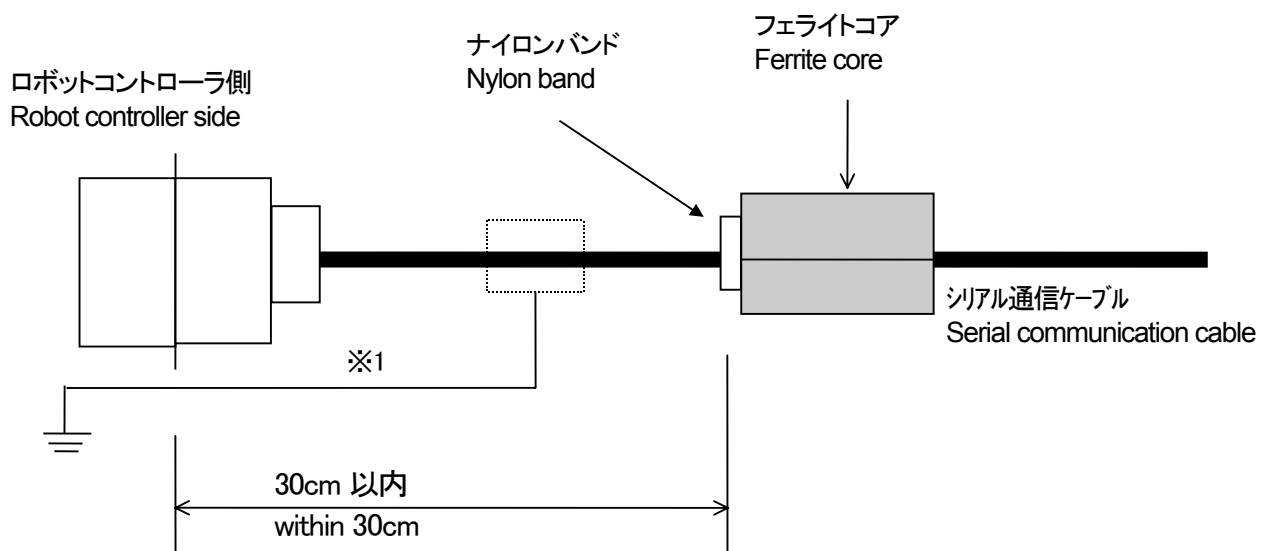
### Coupling procedure of Ferrite core for serial communication cable

ロボットコントローラ内蔵の増設シリアルカードと通信ユニット(パソコンなど)を接続する RS232C 通信ケーブルに、添付のフェライトコアを下図のように取り付けてください。また、フェライトコアはコネクタ接続部から 30cm 以内に配置ください。

それ以外は、ノイズによる誤動作を起こす可能性があります。

The Ferrite core should be installed to the serial communication cable between controller and other communication unit within 30 cm from the controller (See below).

If the customer do not install to the CC-Link cable with the Ferrite core, it will be become a trouble by Immunity and emission noise.



#### ※1 注意 -Caution-

もし、ノイズによる影響を受けやすい環境下でのご使用の場合は、ケーブルのカバーを剥き、アース端子を利用してシールドを直接筐体のアースに落としてください。

If necessary, in case of under the environment of much immunity noise, remove the sheath of the serial communication cable, and connect the shield that is inside a cable with the Earth [PE] terminal directly by cable.

■ History

Print date	Instruction manual No.	Revision content
2000-04-18	BFP-A8106Z	First print
2000-04-25	BFP-A8106	Formal style
2003-09-24	BFP-A8106-A	Error in writing correction.

## ■ Preface

Thank you very much for employing Mitsubishi Electric Industrial Robot CRn-500 Series.

The expansion serial interface is an option to add the communication channel to the robot controller in combination with CRn-500 Series controller. Before use, be sure to read through the manual for sufficient understanding. Then use the expansion serial interface.

The information contained in this document has been written to be accurate as much as possible. Please interpret that items not described in this document "cannot be performed.". Please contact your nearest dealer if you find any doubtful, wrong or skipped point.

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## Safety Precautions

Always read the following precautions and the separate "Safety Manual" before starting use of the robot to learn the required measures to be taken.



### CAUTION

All teaching work must be carried out by an operator who has received special training. (This also applies to maintenance work with the power source turned ON.)

→Enforcement of safety training



### CAUTION

For teaching work, prepare a work plan related to the methods and procedures of operating the robot, and to the measures to be taken when an error occurs or when restarting. Carry out work following this plan. (This also applies to maintenance work with the power source turned ON.)

→Preparation of work plan



### WARNING

Prepare a device that allows operation to be stopped immediately during teaching work. (This also applies to maintenance work with the power source turned ON.)

→Setting of emergency stop switch



### CAUTION

During teaching work, place a sign indicating that teaching work is in progress on the start switch, etc. (This also applies to maintenance work with the power source turned ON.)

→Indication of teaching work in progress



### CAUTION

Provide a fence or enclosure during operation to prevent contact of the operator and robot.

→Installation of safety fence



### CAUTION

Establish a set signaling method to the related operators for starting work, and follow this method.

→Signaling of operation start



### CAUTION

As a principle turn the power OFF during maintenance work. Place a sign indicating that maintenance work is in progress on the start switch, etc.

→Indication of maintenance work in progress



### CAUTION

Before starting work, inspect the robot, emergency stop switch and other related devices, etc., and confirm that there are no errors.

→Inspection before starting work

The points of the precautions given in the separate "Safety Manual" are given below.  
Refer to the actual "Safety Manual" for details.



Use the robot within the environment given in the specifications. Failure to do so could lead to a drop or reliability or faults. (Temperature, humidity, atmosphere, noise environment, etc.)



Transport the robot with the designated transportation posture. Transporting the robot in a non-designated posture could lead to personal injuries or faults from dropping.



Always use the robot installed on a secure table. Use in an instable posture could lead to positional deviation and vibration.



Wire the cable as far away from noise sources as possible. If placed near a noise source, positional deviation or malfunction could occur.



Do not apply excessive force on the connector or excessively bend the cable. Failure to observe this could lead to contact defects or wire breakage.



Make sure that the workpiece weight, including the hand, does not exceed the rated load or tolerable torque. Exceeding these values could lead to alarms or faults.



Securely install the hand and tool, and securely grasp the workpiece. Failure to observe this could lead to personal injuries or damage if the object comes off or flies off during operation.



Securely ground the robot and controller. Failure to observe this could lead to malfunctioning by noise or to electric shock accidents.



Indicate the operation state during robot operation. Failure to indicate the state could lead to operators approaching the robot or to incorrect operation.



When carrying out teaching work in the robot's movement range, always secure the priority right for the robot control. Failure to observe this could lead to personal injuries or damage if the robot is started with external commands.



Keep the jog speed as low as possible, and always watch the robot. Failure to do so could lead to interference with the workpiece or peripheral devices.



After editing the program, always confirm the operation with step operation before starting automatic operation. Failure to do so could lead to interference with peripheral devices because of programming mistakes, etc.



Make sure that if the safety fence entrance door is opened during automatic operation, the door is locked or that the robot will automatically stop. Failure to do so could lead to personal injuries.



Never carry out modifications based on personal judgments, or use non-designated maintenance parts. Failure to observe this could lead to faults or failures.



When the robot arm has to be moved by hand from an external area, do not place hands or fingers in the openings. Failure to observe this could lead to hands or fingers catching depending on the posture.



Do not stop the robot or apply emergency stop by turning the robot controller's main power OFF.  
If the robot controller main power is turned OFF during automatic operation, the robot accuracy could be adversely affected.

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# 1.Before use

This chapter describes the confirmation items and cautionary items which must be read before practical use of the expansion serial interface.

## 1.1.How to use the instruction manual

### 1.1.1.Content of instruction manual

Through the following configuration, this document introduces the functions which are added or changed in the expansion serial interface. For the functions and their operating methods provided in the standard robot controller, refer to "instruction manual" appended to the robot controller.

Table 1.1 Details of instruction manual

Chapter	Title	Details
1	Before use	Together with the using method of the instruction manual, the confirmation items and cautionary items are introduced to use the expansion serial interface. Read through the chapter before practical use of the expansion serial interface.
2	Preparation before use	The preparatory work is introduced to use the expansion serial interface. Referring to the chapter, install the interface card, apply the cable wiring and check the other setting items.
3	Trial for operation	Using the system configured in "Chapter 2 Preparation before use, this document", this chapter introduces a series of the operating methods from the start-up to the stop. Referring to each introduction, understand the basic operating methods.
4	Design and engineering	It introduces the specifications of the connectors and the introduction examples of the systems necessary to introduce the expansion serial interface. Referring to this chapter, take full advantage of the expansion serial interface further more.
5	Appendix	Since the errors added to index the term or use the expansion serial interface are described, refer to them as necessary. For the parameter error list, etc. not directly related when the commands and additional axes are connected, refer to the items of the instruction manual of the controller.

## 1.2. Terms used in the instruction manual

The following terms are used in this document.

### (1) Expansion serial interface

The expansion serial interface is an option which adds the serial channels to the robot controller in combination with CRn-500 Series controller.

### (2) RS-232C

It is one of the serial communication standards standardized by Electronic Industries Alliance (EIA) of America. It is the most popular serial communication system, being equipped in most of the personal computers. The maximum length of the cable is approximate 15m. On this product, it is used to connect the robot controller to the personal computer, vision sensor and other calculators. The connector of the card is a D-sub 25 pin type.

### (3) RS-422

It is one of the serial communication standards standardized by Electronic Industries Alliance (EIA) of America, being the upward compatible type of RS-232C which is the most popular. Our vision sensor uses RS-422. The maximum length of the applicable cable is 500mm. On this product, it is used to connect the robot controller to the vision sensor and other calculators. The connector of the card is a D-sub 25 pin type.

### (4) RS-485

It is one of the interface standards of the serial transmission. It can be connected to a maximum of 32 drivers and receivers. The transmission distance is a maximum of 1200m but is different depending on the transmission speed. (10Mbps:12m, 1Mbps:120m, 100Kbps:1200m)

### (5) T/B

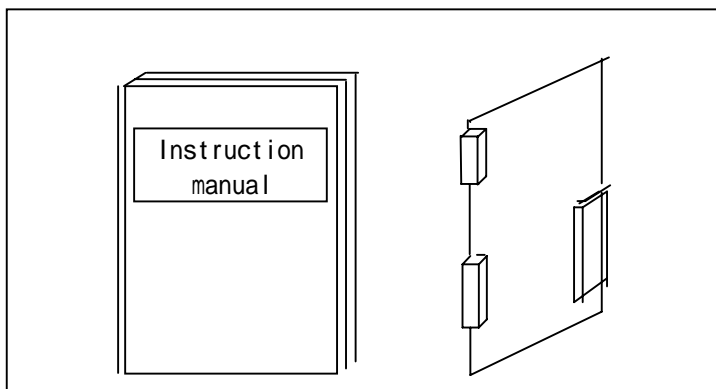
It is the abbreviation of the teaching pendant. (The teaching pendant is optional.)

### 1.3. Check of product

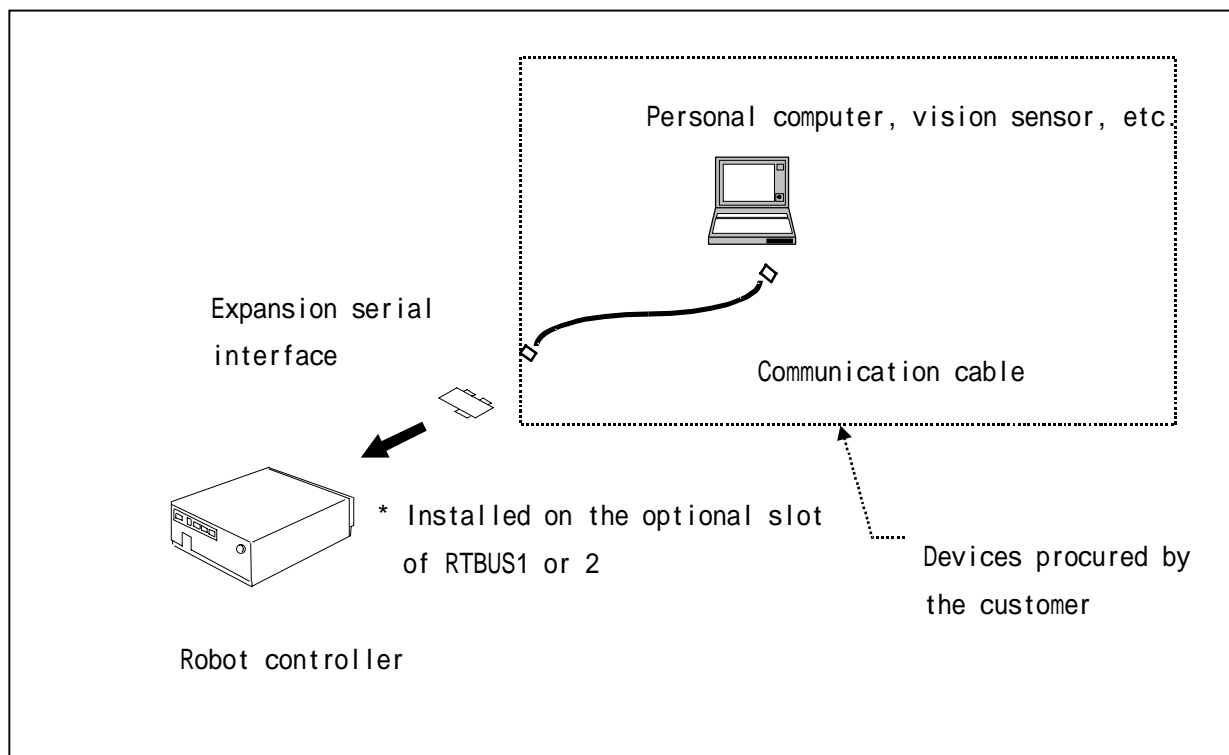
The standard configuration of the product procured by the customer is as follows. Check the configuration.

No.	Part name	Type	Qty.
①	Instruction manual (this document)	BFP-A8106	1
②	Expansion serial interface card	RZ581	1

In addition to the standard robot system configuration, the following are necessary. These devices are separately procured by the customer.



No.	Part name	Type	Qty.
③	Personal computer, vision sensor, etc.		1~
④	Communication cable	RS-232C or RS-422	1~



## 1.4. Expansion serial interface

The expansion serial interface has the following functions.

- (1) One card can expand the communication line to maximum 2 channels.
- (2) The channel 1 is exclusive for RS-232C.
- (3) The channel 2 is alternative for RS-232C or RS-422.

If the channel is connected with the cable of the RS-232C pin assignment later introduced, it works as RS-232C.

If it is connected with the cable of the RS-422 pin assignment, it works as RS-422. Here, it is not specially necessary to set the parameters with the setting pin or T/B.

- (4) Two cards can be installed on one controller. (The communication line of maximum 4 channels cable connected.)
- (5) The expanded communication channel can similarly function like RS-232C on the front side of the controller equipped as standard.

No.	Function outline
(1)	Support software function The personal computer support software (applicable to the separately available RS-232C) is used to allow the communication with the robot controller via RS-232C/RS-422. (Program up/down load, status monitor, etc.)
(2)	Data link function MELFABASICIV language (OPEN/PRINT/INPUT) is used to allow the data link of the numerical value/position data.

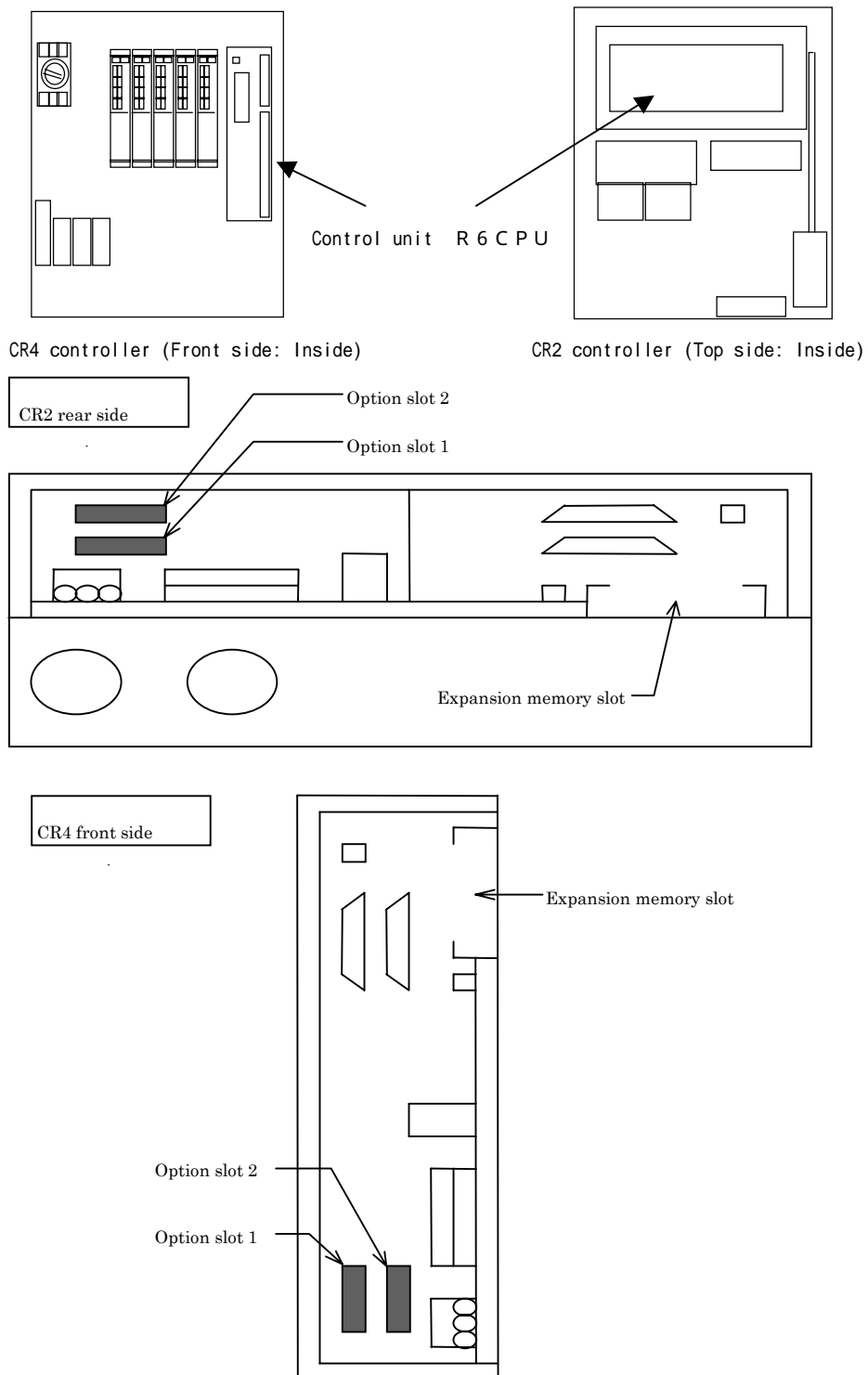
## 2.Preparation before use

What must be done before use is herein described.

2.1 Installation of expansion serial interface .....Refer to 2.2.



2.2 Parameter setting .....Refer to 2.2.

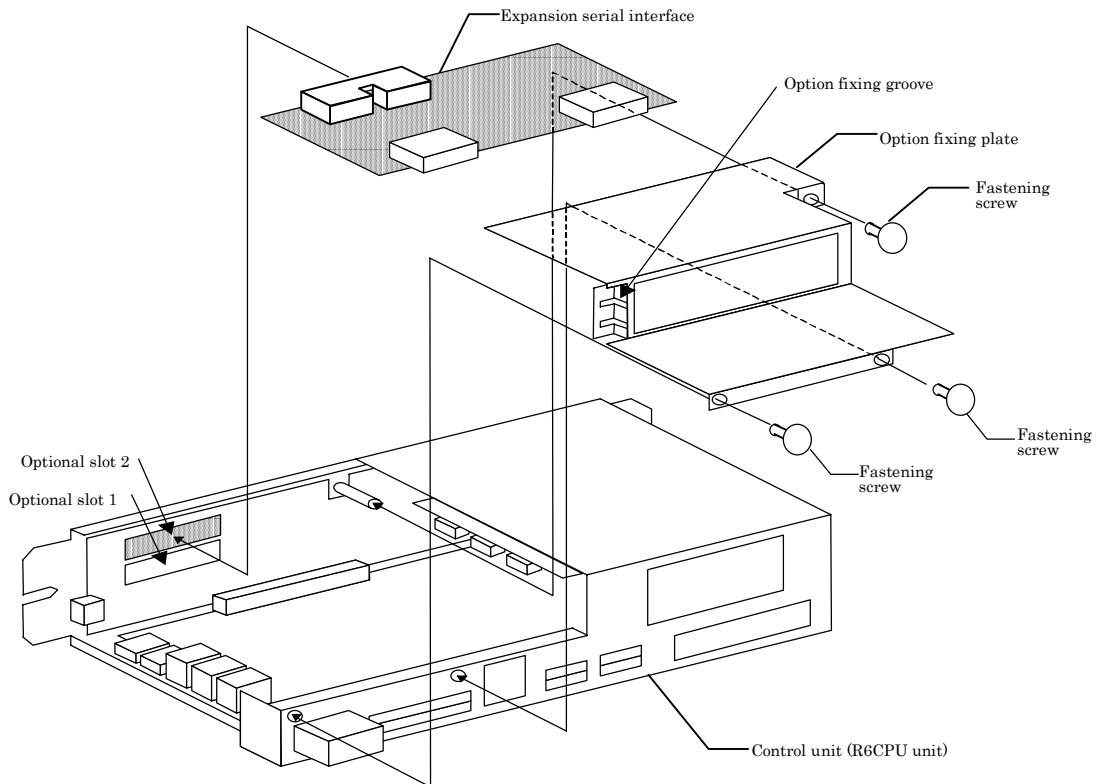


## 2.1. Installation of expansion serial interface

The procedure to install the expansion serial interface card is herein described. As the following procedure, install the card. When using the CR1 controller, refer to "Installation of optional device" of "Controller setup, basic operation and maintenance" in the instruction manual of CR1 controller. The expansion serial interface is installed in the control unit (R6CPU unit) of the controller or in the optional slot 1(OPT1) or 2(OPT2) of the expansion optional box. For details of the control unit (R6CPU unit), refer to the instruction manual "Controller setup, basic operation and maintenance". In this example, the expansion serial interface card is installed in the optional slot 2 (RTBUS2).

### Procedure to install the expansion serial interface

- (1) Remove the optional fixing plate of the control unit (R6CPU unit). (Three fastening screws)
- (2) Insert the expansion serial interface to the optional slot 2 (OPT2).
- (3) Install the optional fixing plate, engaging the end of the expansion serial interface into the optional fixing groove.  
Reversing procedure (1), tighten the fastening screws (3 places) for fixation.
- (4) Connect the serial communication cable to the expansion serial interface.
- (5) Process the outlet port of the serial communication cable connected. For details, refer to the instruction manual "Controller setup, basic operation and maintenance" of each controller.



## 2.2.Parameter setting

Before use, it is necessary to set the parameters. At shipment,

(1) Support software function (2) Baud rate 9600 (3) Character length 8 bits (4) Parity even (5) Stop bit 2 they are factory-set as follows.

These parameters are shown below. For the setting method of the parameters, refer to the instruction manual of the controller.

### ⚠ Caution

After changing the parameters, turn the power supply of the controller from OFF to ON. Unless this is done, the changed parameters will not become valid.

#### 【Parameter list】

The parameters are listed below.

The number of the connector connected to the cable is shown in "CH" column of the list. "1" is set at CON1, "2" is set at CON2 for RS-232C, and "3" is set at "CON2" for RS-422. In the "SLT" column of the list, the parameter of "1" is changed when the expansion serial interface is installed at RTBUS1(slot1) but the parameter of "2" is changed when it is installed at RTBUS2(slot2).

Instruction of expansion serial card connector

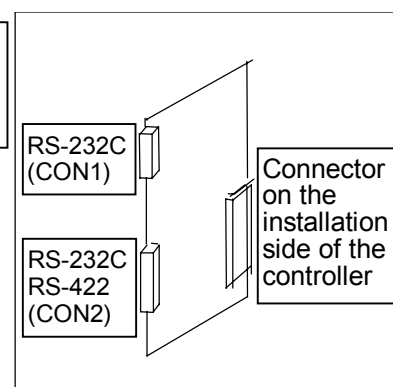


Table Parameter List

Parameter name	Description	Number of elements	Default value	CH	SLT
CBAUE11	Communication baud rate [2400/4800/9600/19200]	Numerical value 1	9600	1	1
CLENE11	Character length [8/7]	Numerical value 1	8		
CPRTYE11	Parity [0/1/2 = No/Odd/Even]	Numerical value 1	2		
CSTOPE11	Stop bit [1/2]	Numerical value 1	2		
CTERME11	End code [0/1 = CR/CR+LF] "0" is set when our personal computer support software is used.	Numerical value 1	0		
CPRCE11	Protocol [0/1/2 = support software/reserved/data link function]	Numerical value 1	0		
CDTRE11	DTR control [0/1 = No/Yes] When "No" is selected, DTR is always ON. "0" is set when our personal computer support software and MELFA-BASICIV language are used.	Numerical value 1	0	2	
CBAUE12	Communication baud rate [2400/4800/9600/19200]	Numerical value 1	9600		
CLENE12	Character length [8/7]	Numerical value 1	8		
CPRTYE12	Parity [0/1/2 = No/Odd/Even]	Numerical value 1	2		
CSTOPE12	Stop bit [1/2]	Numerical value 1	2		
CTERME12	End code [0/1 = CR/CR+LF]	Numerical value 1	0		
CPRCE12	Protocol [0/1/2 = support software/reserved/data link function]	Numerical value 1	0	3	
CDTRE12	DTR control [0/1 = No/Yes] When "No" is selected, DTR is always ON.	Numerical value 1	0		
CBAUE13	Communication baud rate [2400/4800/9600/19200]	Numerical value 1	9600		
CLENE13	Character length [8/7]	Numerical value 1	8		



2Preparation before use

CPRTYE13	Parity [0/1/2 = No/Odd/Even]	Numerical value 1	2		
CSTOPE13	Stop bit [1/2]	Numerical value 1	2		
CTERME13	End code [0/1 = CR/CR+LF]	Numerical value 1	0		
CPRCE13	Protocol [0/1/2 = support software/reserved/data link function]	Numerical value 1	0		
CDTRE13	DTR control [0/1 = No/Yes] When "No" is selected, DTR is always ON.	Numerical value 1	0		
CBAUE21	Communication baud rate [2400/4800/9600/19200]	Numerical value 1	9600	1	2
CLENE21	Character length [8/7]	Numerical value 1	8		
CPRTYE21	Parity [0/1/2 = No/Odd/Even]	Numerical value 1	2		
CSTOPE21	Stop bit [1/2]	Numerical value 1	2		
CTERME21	End code [0/1 = CR/CR+LF]	Numerical value 1	0		
CPRCE21	Protocol [0/1/2 = support software/reserved/data link function]	Numerical value 1	0		
CDTRE21	DTR control [0/1 = No/Yes] When "No" is selected, DTR is always ON.	Numerical value 1	0		
CBAUE22	Communication baud rate [2400/4800/9600/19200]	Numerical value 1	9600	2	
CLENE22	Character length [8/7]	Numerical value 1	8		
CPRTYE22	Parity [0/1/2 = No/Odd/Even]	Numerical value 1	2		
CSTOPE22	Stop bit [1/2]	Numerical value 1	2		
CTERME22	End code [0/1 = CR/CR+LF]	Numerical value 1	0		
CPRCE22	Protocol [0/1/2 = support software/reserved/data link function]	Numerical value 1	0		
CDTRE22	DTR control [0/1 = No/Yes] When "No" is selected, DTR is always ON.	Numerical value 1	0		
CBAUE23	Communication baud rate [2400/4800/9600/19200]	Numerical value 1	9600	3	
CLENE23	Character length [8/7]	Numerical value 1	8		
CPRTYE23	Parity [0/1/2 = No/Odd/Even]	Numerical value 1	2		
CSTOPE23	Parity [0/1/2 = No/Odd/Even]	Numerical value 1	2		
CTERME23	End code [0/1 = CR/CR+LF]	Numerical value 1	0		
CPRCE23	Protocol [0/1/2 = support software/reserved/data link function]	Numerical value 1	0		
CDTRE23	DTR control [0/1 = No/Yes] When "No" is selected, DTR is always ON.	Numerical value 1	0		

Parameter name	Description	Number of elements	Default value
COMDEV	<p>The parameter is necessary to set for the data link. It is specified with OPEN sentence of the program. The device which corresponds to COMn is specified with the parameter. (n in the range of 1 to 8)</p> <p>COM1, COM2...COM8 are sequential from the left of the parameter element. When the expansion serial interface is used for COM, the following are input as the values of the parameters.</p> <p>At the installation slot 1, "OPT11" for CH1  At the installation slot 1, "OPT12" for CH2(RS-232)  At the installation slot 1, "OPT13" for CH2(RS-422)  At the installation slot 2, "OPT21" for CH1  At the installation slot 2, "OPT22" for CH2(RS-232)  At the installation slot 2, "OPT23" for CH2(RS-422)</p> <p>For example, when CH1("OPT11") is used at the installation slot 1 and it is allocated to COM2,;  "RS-232", "OPT11" , , , , , are set.  When CH2("OPT22") is used at the installation slot 2 and it is allocated to COM3,;  "RS-232", , "OPT22" , , , , , are set.</p> <p>Here, the standard RS-232C on the front side of the controller is previously allocated to COM1:.</p>	Character string 8	RS232, , , , , , , ,

## 2.3. Connection confirmation

Before use, confirm the following items again.

### Connection confirmation

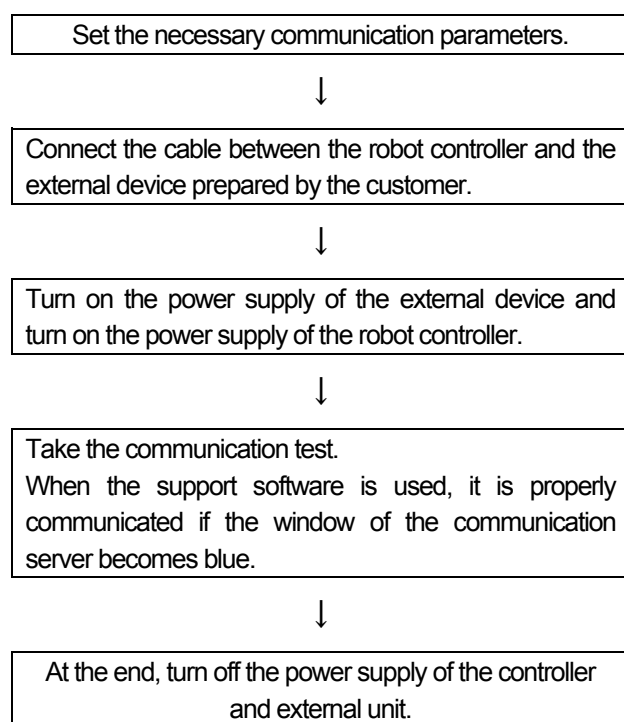
No.	Confirmation items	Check
1	Is the expansion serial interface card securely installed in the slot of the controller?	
2	Is the expansion serial interface card properly connected to the communication cable of the external unit prepared?	
3	Does the communication parameter of the robot controller (2.2 Parameter setting) match the communication parameter of the external device?	
4	Is the power supply of the controller turned off once after the parameter is set?	
5	Is "2" set at the parameter CPRCEnn when the data link function is used? Is the COM number allocated at the parameter COMDEV?	
6	It is connected to our optional personal computer support software and Is "0" set at CDTREnn when the robot language MELFA-BASSICIV is used?	
7	Is it transmitted after CTS and DTR are turned on in order to transmit the data from the external device when the power supply is turned on?	
8	Is it properly connected to the pins assigned to the cable used?	

## 3.Trial for operation

### 3.1.Support software function

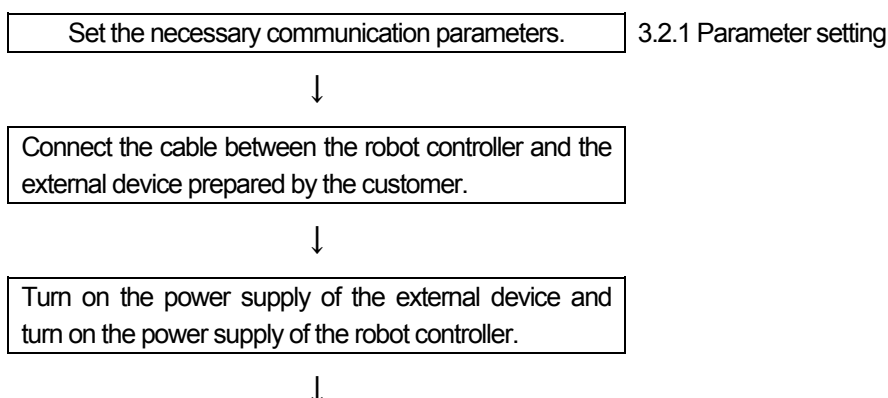
- (1) Before using the optional support software, confirm that [communication setting] of the support software matches the parameter setting of the controller. Here, the parameters factory-set at shipment are used without change (when the personal computer support software is factory-set at shipment).
- (2) If the personal computer software separately sold is bought and the communication software is manufactured by the customer, refer to the instruction manual of the support software.

● Before use, confirm the pin assignment, connection and communication parameters of the cable.



### 3.2.Data link function

Here, it explains such a case as the expansion serial interface is installed at the slot 1 and CH1 is used.



3.2.1 Parameter setting

3 Trial for operation

Take the communication test.

3.2.2 Communication test program



At the end, turn off the power supply of the controller and external device.

### 3.2.1.Parameter setting

Name of changed parameter	Before/after change	Parameter value
CPRCE11	Before	0
	After	2
COMDEV	Before	RS232, , , , , , ,
	After	RS232,OPT11 , , , , , , ,

## ⚠Caution

When the parameter is changed, it is necessary to surely turn off the power supply once.

### 3.2.2.Communication test program

The test program is applied to an example of data link between the robot and personal computer.

(1)When the robot transmits the following data to the personal computer, the data will be processed by the personal computer.

"START"(CR) (CR) represents the CR code.

(2)When the personal computer receives "START", the data will be processed and the result will be sent in the following format. "Numerical value data, position data X, position data Y, position data Z"(CR) (CR) represents the CR code.

(Example: "0, 10.03, 15.38, 1.98" (CR))

(3)When the numerical value data is 0, the robot will be moved from the current position to the fetched position shifted in the tool coordinate system. If any other value except 0 is set, nothing will be done.

The program to repeat the operation is shown as an example.

<Robot program>

```

10 OPEN "COM2:" AS #1
11 PRINT #1, "START"
12 PO=P_NULL
13 INPUT #1, M1, PO. X, PO. Y, PO. Z
14 IF M1<>0 GOTO 11
15 MOV P_CURR * PO
16 GOTO 11

```

<Personal computer – N88BASIC as an example>

```

10 OPEN "COM1:E83NN" AS #1
11 INPUT #1, A$
12 IF A$<>"START" GOTO *ERR
:(Process)
100 PRINT #1, 0, MX, MY, MZ
101 GOTO 11
:
200 *ERR
201 PRINT #1, 1      ' It is unnecessary to transmit X, Y and Z data.
202 GOTO 11

```



## 4.Design and engineering

### 4.1.Connector pin assignment

The connector pin assignment of the expansion serial interface are shown.

(1) Pin assignment of RS-232C of CON1 (channel 1)

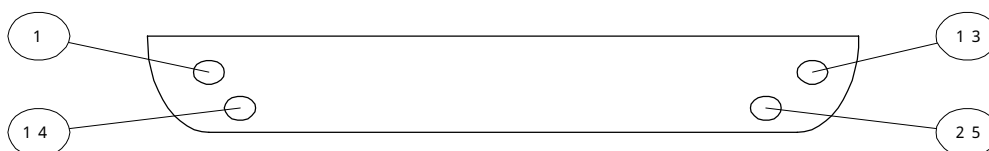
Pin No.	Signal name	Description	I/O	Remarks
2	TXD	Data transmitted to external device	O	
3	RXD	Data received from external device	I	
4	RTS	Request To Send	O	
5	CTS	Clear To Send	I	
6	DSR	Data Set Ready	I	
20	DTR	Data Terminal Ready	O	
7	SG	Control power supply 0V	—	
1	FG	Earth	—	Connect earth to shield of cable
8	DCD	Receiving carrier detect	I	
22	RI	Ring Indicator	I	

(2) Pin assignment of RS-232C of CON2 (channel 2)

Pin No.	Signal name	Description	I/O	Remarks
2	TXD	Data transmitted to external device	O	
3	RXD	Data received from external device	I	
4	RTS	Request To Send	O	
5	CTS	Clear To Send	I	
6	DSR	Data Set Ready	I	
20	DTR	Data Terminal Ready	O	
7	SG	Control power supply 0V	—	
1	FG	Earth	—	Connect earth to shield of cable

(3) Pin assignment of RS-422 of CON2 (channel 2)

Pin No.	Signal name	Description	I/O	Remarks
13	TXDH	Transmitted data + side	O	
12	RXDH	Received data + side	I	
11	DTRH	Data Terminal Ready + side	O	
10	DSRH	Data Set Ready + side	I	
25	TXDL	Transmitted data - side	O	
24	RXDL	Received data - side	I	
23	DTRL	Data Terminal Ready — side	O	
22	DSRL	Data Set Ready — side	I	
9	SG	Control power supply 0V	—	



D-sub 25-pin layout (Front view of connector)



## 4.2.Data communication among robot program, vision sensor and PLC

### ( 1 ) System configuration

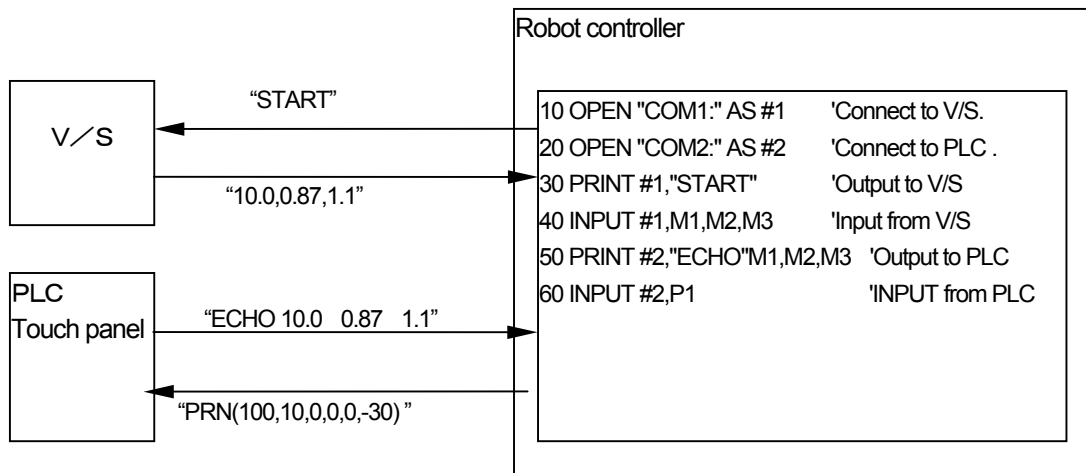
The data is communicated among the robot program, vision sensor and PLC.

As practical, the data is output from the robot program to the external device with PRINT command. Data can be fetched from the external device to the robot with INPUT command.

The system is configured as follows.

If any asynchronous communication occurs against V/S and PLC, it is necessary to separate the communication program with PLC from the motion program for communication with V/S and execute the multitask operation.

If the vision is connected to RS-232C on the front side of the controller, the expansion serial I/F is installed in the optional slot 1 and PLC is connected to CON1,



Parameter setting: COMDEV="RS232", "OPT11", "OPT12", , ,  
 CPRCE232 = 2  
 CPRCE11 = 0

#### [Communication specifications]

- . The communication data are formatted in ASCII alone but the binary data are not processed.
- . When "0" is set at OPRCE\*\*, it is necessary to add the character PRN to the head of the data transmitted from the external device. In this case, it can be connected to the personal computer support software of our company without changing the parameter (CPRCE\*\*). (It is necessary that the communication speed, character length, etc. match the setting.) If it is communicated with the external device when "1" is set at CPRCE\*\*, reset CPRCE\*\* to "0" once to connect the personal computer support software of our company.
- . Comma or space is used as the separator when plural data is transmitted from the external device to the controller.
- . The fetched data is automatically converted and substituted, identifying the argument type of INPUT command.
- . In case of the above COMDEV setting, CON2 of the expansion serial I/F becomes "COM3:".

## 5.Appendix

### 5.1. Error list

The errors which occur when only the expansion serial interface is used are listed as follows.

Error No.	Error occurrence causes and remedies
7901	Causes) The communication setting parameter value of CH1 of the slot 1 is improper. (Overrun/framing/parity occurs.) Remedies) Confirm the setting value of the communication parameter.
7902	Causes) The communication setting parameter value of CH2 of the slot 1 is improper. (Overrun/framing/parity occurs.) Remedies) Confirm the setting value of the communication parameter.
7903	Causes) The communication setting parameter value of CH3 of the slot 1 is improper. (Overrun/framing/parity occurs.) Remedies) Confirm the setting value of the communication parameter.
7911	Causes) The communication setting parameter value of CH1 of the slot 2 is improper. (Overrun/framing/parity occurs.) Remedies) Confirm the setting value of the communication parameter.
7912	Causes) The communication setting parameter value of CH2 of the slot 2 is improper. (Overrun/framing/parity occurs.) Remedies) Confirm the setting value of the communication parameter.
7913	Causes) The communication setting parameter value of CH3 of the slot 2 is improper. (Overrun/framing/parity occurs.) Remedies) Confirm the setting value of the communication parameter.

For the other errors, refer to the error list of the instruction manual of the controller.



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