

1/2-Axes Motor Control Unit

**MR210AU / MR220AU**

**Serial Communication Commands**

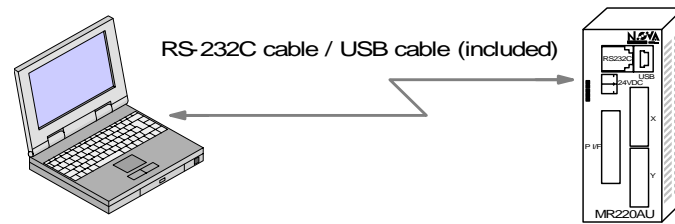
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**NOVA electronics**

# 1. Outline

These communication commands are prepared for control by the user program in VC or VB when MR210AU/220AU and PC or PLC are connected with the cable.



Before control by communication commands, driving parameters and modes of MR210AU/220AU must be configured by the operating program in the accessory CD-ROM in advance. When the user executes or stops a program by communication commands, the program should also be registered in advance.

Communication commands are listed below. See chapter 3 for more details on each command.

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## 2. General Notes for Communication Commands

(1) The information in this document is subject to change without notice for updates and improvements.

The latest version is available on our web site: <http://www.novaelec.co.jp/eng/index.html>

(2) When sending each command, send it in uppercase.

(3) Before writing drive command at first power-on, SPD command must be written to determine a drive speed.

(4) In MR210AU (1-axis), the axis is "X". Make sure to select "X" for axis assignment.

(5) Communication conditions are as follows:

Communication speed : 9600, 19200, 38400BPS  
 Data bit : 8 bit  
 Stop bit : 1 bit  
 Flow control : None  
 Parity bit : None  
 Character assignment : 0-9, A-Z, △ (Space), [CR] (Carriage return)  
 Alphabetic characters are all the upper case characters.

※ When Communication Error happens between MR210AU/220AU and Personal Computer(or Programmable Logic Controller), choose the lower baud date.

(6) Concerning the command with no response, wait the time shown as below according to the communication speed, then write the next command. Concerning the command with a response, write the next command after confirmation of receiving response data.

Communication Speed (bps)	Waiting time of the no response command (msec)
9600	55
19200	35
38400	25

(7) Notes for command details

△ mark means a space.

[CR] means a 0x0d carriage return.

[LF] means a 0x0a line feed.

## 3. Command Details

### PRG

---

[Contents] Executes the driving program of MR210AU/220AU from the specified address.

[Format]

Command  $\Delta$  [Axis] [REG number] [CR]

$$\text{PRG } \Delta \left| \begin{array}{l} \text{X} \\ \text{Y} \end{array} \right| \left| \begin{array}{l} \text{OO} \\ \text{ } \end{array} \right| \text{ [CR]}$$

REG number (decimal number)

REG number must be specified by a decimal number 2-digits, which is from 00 to 63.

Multiple axes can be designated at a time.

Even though it is for 1-axis (MR210AU), be sure to input "X" for axis assignment.

[Example]

When X and Y axes are executed from 0 of the REG number.

PRG  $\Delta$  X Y 0 0 [CR]

[Response] No response

### JOG

---

[Contents] Continuous drive command. Starts to drive the specified axis.  
To stop driving, write STO command.

[Format]

Command  $\Delta$  [Driving direction] [Axis] [CR]

$$\text{JOG } \Delta \left| \begin{array}{l} + \\ - \end{array} \right| \left| \begin{array}{l} \text{X} \\ \text{Y} \end{array} \right| \text{ [CR]}$$

Multiple axes can be designated at a time.

Even though it is for 1-axis (MR210AU), be sure to input "X" for axis assignment.

[Example]

When driving of X axis is performed in the + direction and driving of Y axis is performed in the - direction.

JOG  $\Delta$  X - Y [CR]

Direction designation "+" before axis assignment can be omitted.

[Response] No response

## P A B

---

[Contents] Absolute position move driving. Starts to drive the specified axis to absolute position.

[Format]

Command  $\Delta$  [X-axis absolute position] [Y-axis absolute position] [CR]

P A B  $\Delta$  ○○○○○○○○○○, ○○○○○○○○○○ [CR]

Absolute position is pulse value.

When the user does not drive X-axis, input only comma “,”.

[Example]

- In 2-axes, when the user wants to move Y-axis absolute position to 1500 pulse.

P A B  $\Delta$ , 1 5 0 0 [C R]

- In 1-axis, the user wants to move absolute position to 2000 pulse.

P A B  $\Delta$  2 0 0 0 [C R]

[Response] No response

## P I C

---

[Contents] Relative position move driving. Starts to drive the specified axis to relative position.

[Format]

Command  $\Delta$  [X-axis relative position] [Y-axis relative position] [CR]

P I C  $\Delta$  ○○○○○○○○○○, ○○○○○○○○○○ [CR]

Relative position is pulse value.

When the user does not drive X-axis, input only comma “,”.

To move in the – direction, input “– “ in front of the numeric value.

[Example]

- In 2-axes, when the user wants to move only Y-axis from the current position to 1500 pulse in the – direction.

P I C  $\Delta$ , – 1 5 0 0 [C R]

- In 1-axis, when the user wants to move from the current position to 3000 pulse in the – direction.

P I C  $\Delta$ – 3 0 0 0 [C R]

[Response] No response

## CLL

---

[Contents] Position counter is cleared. Clears the position counter value of the specified axis to 0.

[Format]

Command  $\Delta$  [Axis] [CR]

CLL  $\Delta$   $\left| \begin{array}{c} X \\ Y \end{array} \right|$  [CR]

Multiple axes can be designated at a time.

Even though it is for 1-axis (MR210AU), be sure to input "X" for axis assignment.

[Examples]

- In 2-axes, when the user wants to clear both X and Y axes.

CLL  $\Delta$  X Y [CR]

- In 1-axis, when the user wants to clear.

CLL  $\Delta$  X [CR]

[Response] No response

## SPD

---

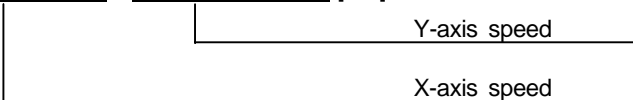
[Contents] Drive speed setting and current speed reading.

### In case of speed setting

[Format]

Command  $\Delta$  [X axis speed setting value] [Y axis speed setting value] [CR]

SPD  $\Delta$  ○○○○○○○○○, ○○○○○○○○○ [CR]



Actual drive speed is the value which multiplies the above setting value by speed multiplier.

$$\text{Drive speed (PPS)} = \text{Speed setting value} \times \text{Speed multiplier}$$

If the user wants to set the speed individually, input only comma as to the unnecessary axis.

[Example]

- In 2-axes, the user wants to change the speed of only Y axis to 1500PPS when speed multiplier = 1.

SPD  $\Delta$ , 1 5 0 0 [CR]

- In 1-axis, the user wants to change the speed to 2000PPS when speed multiplier = 1.

SPD  $\Delta$  2 0 0 0 [CR]

[Response] No response

**In case of speed reading**

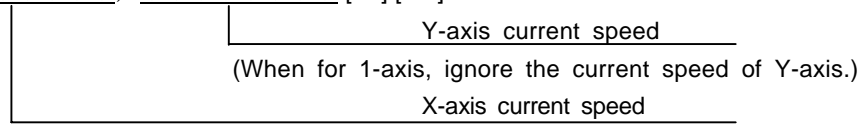
[Format]

Command [CR]

SPD [CR]

[Response]

SPD Δ ○○○○○○○○○, ○○○○○○○○○ [LF] [CR]



Actual drive speed is the value which multiplies the above acquired value by speed multiplier.

$$\text{Drive speed (PPS)} = \text{Speed read value} \times \text{Speed multiplier}$$

※ In 1-axis, the current speed data of Y-axis is also returned as a response but ignore it.

**POS**

[Contents] Current position reading. Returns the position value.

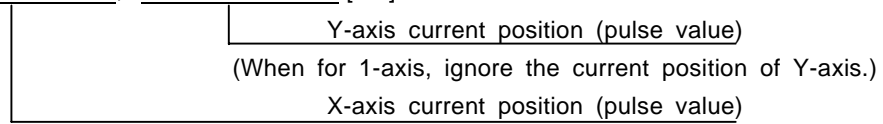
[Format]

Command [CR]

POS [CR]

[Response]

POS Δ ○○○○○○○○○, ○○○○○○○○○ [CR]



The current position pulses of the response of each axis are given in hexadecimal.

※ In 1-axis, the current position data of Y-axis is also returned as a response but ignore it.

## HOM

---

[Contents] Executes the home search of the specified axis.

[Format]

Command  $\Delta$  [Axis] [CR]

HOM  $\Delta$   $\left| \begin{array}{c} X \\ Y \end{array} \right|$  [CR]

Multiple axes can be designated at a time.

Even though it is for 1-axis (MR210AU), be sure to input "X" for axis assignment.

[Example]

- In 2-axes, when the user wants to execute a home search for both X and Y axes.

HOM $\Delta$ XY [CR]

- In 1-axis, when the user wants to execute a home search.

HOM $\Delta$ X [CR]

[Response] No response

## STO

---

[Contents] Stops driving of the specified axis by decelerating.

However, if drive speed is lower than start speed, it stops instantly.

[Format]

Command  $\Delta$  [Axis] [CR]

STO  $\Delta$   $\left| \begin{array}{c} X \\ Y \end{array} \right|$  [CR]

Multiple axes can be designated at a time.

Even though it is for 1-axis (MR210AU), be sure to input "X" for axis assignment.

[Examples]

- In 2-axes, when the user wants to stop both X and Y axes by decelerating.

STO $\Delta$ XY [CR]

- In 1-axis, when the user wants to stop by decelerating.

STO $\Delta$ X [CR]

[Response] No response

## VER

---

[Contents] Reads the version information of MR210AU/220AU.

[Format]

Command [CR]

VER [CR]

[Response]

VER  $\Delta$  XXXXXXXXXX, XXXXXXXXXX-X-X [LF] [CR]

USB: 0: nonexistence, 1: existence

Control Axis:MR210AU: 1,MR220AU: 2

Revision number

Version number



## I D C

---

[Contents] Returns the program number currently executed (0~63) during program execution.

[Format]

Command  $\Delta$  [Axis] [CR]

IDC  $\Delta$ 

X	[CR]
Y	

Even though it is for 1-axis (MR210AU), be sure to input "X" for axis assignment.

[Response]

IDC  $\Delta$ 

X	OO	[CR]
Y	Program number (decimal number)	

## S S M

---

[Contents] Selects drive speed 1~4.

[Format]

Command  $\Delta$  [Axis] [Drive speed select] [CR]

SSM  $\Delta$ 

X	O	[CR]
Y	1 ~ 4	

Even though it is for 1-axis (MR210AU), be sure to input "X" for axis assignment.

[Response] No response

# I N R

[Contents] Returns I/O signal status and driving state in hexadecimal in bit configuration.

[Format]

Command  $\Delta$  [Axis] [CR]

INR  $\Delta$ 

X
Y

 [CR]

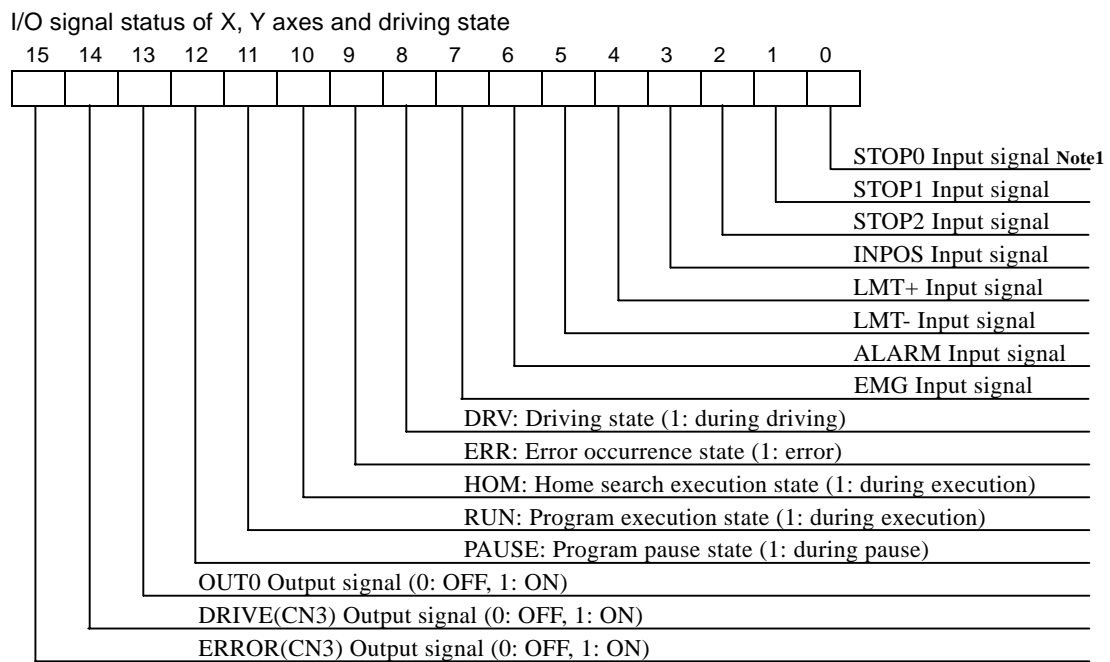
Even though it is for 1-axis (MR210AU), be sure to input "X" for axis assignment.

[Response]

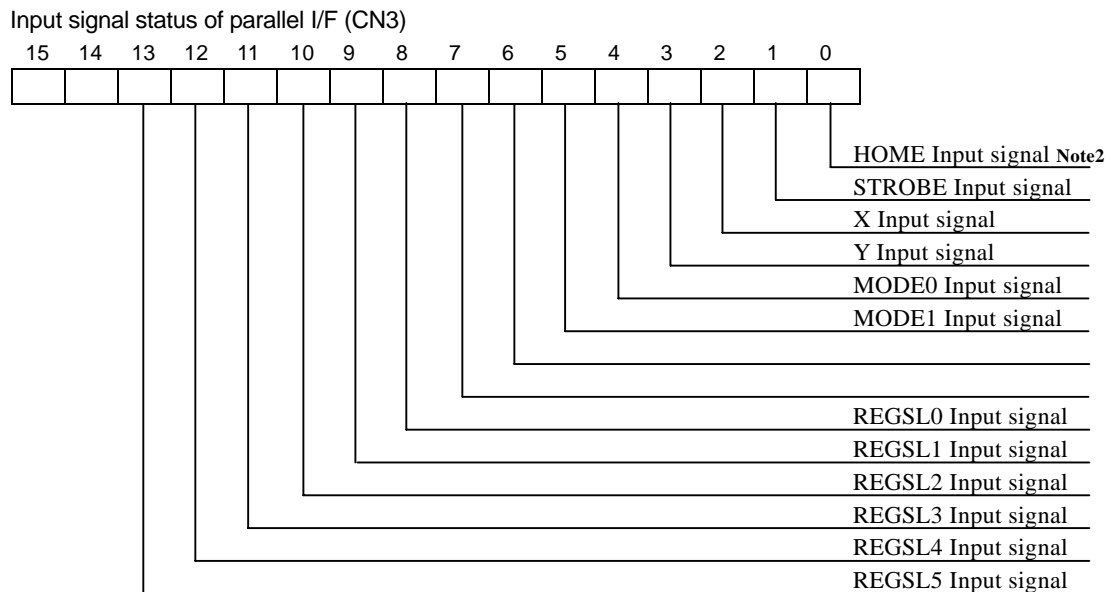
INR  $\Delta$ 

X
Y

○○○○○,  $\Delta$  ○○○○○ [CR]  
 Input signal status of parallel I/F (CN3) (hexadecimal)  
 I/O signal status of X, Y axes and driving state (hexadecimal)



**Note1:** Input signal is 0: GEX short-circuited, 1: Open



**Note2:** Input signal is 0: GEX short-circuited, 1: Open

## OUT

---

[Contents] Controls output signal ON/OFF. Specify bit data in hexadecimal.

[Format]

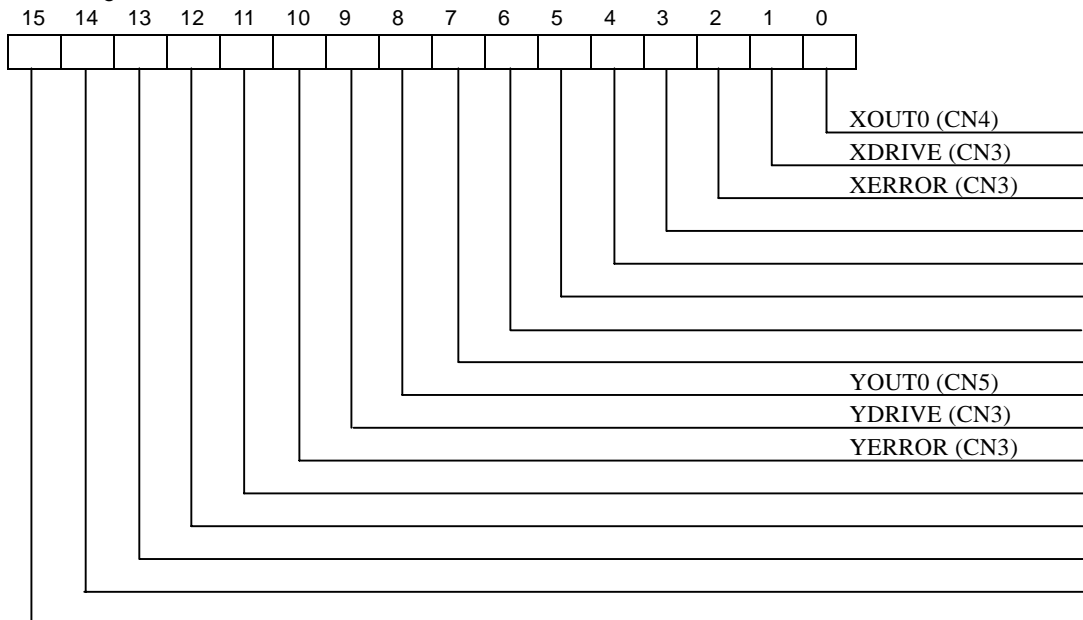
Command  $\Delta$  [Data] [CR]

OUT  $\Delta$  ○○○○ [CR]

0: OFF... "H" Level

1: ON ... "L" Level

Bit Configuration



## RST

---

[Contents] Resets MR210AU/220AU.

[Format]

Command [CR]

RST [CR]

[Response] No response

If each axis is driving, driving stops instantly and MR210AU/220AU is reset.

## SCI

---

[Contents]      Rewrites and reads communication port condition. When rewriting, the motor control unit needs to be reset.

[Format]

(1) When reading is performed.

Command [CR]

SCI [CR]

(2) When writing is performed.

Command  $\Delta$  [Baud rate], [Data bit], [Stop bit], [Parity bit] [CR]

SCI  $\Delta$  19200, 8, 1, 0 [CR]

### Writing Data Type

Baud rate:	9600	[ 9600BPS]
	19200	[19200BPS]
	38400	[38400BPS]
	57600	[57600BPS]
	115200	[115200BPS]
Data bit:	8	[8bit]
	7	[7bit]
Stop bit:	1	[1bit]
	2	[2bit]
Parity bit:	0	[No parity]
	1	[Odd parity]
	2	[Even parity]

[Response]

(1) When reading is performed.

Reading data is also the same format as above writing data type.

(2) When writing is performed.

Writing data is returned.

## OGE

---

[Contents]      Terminates a home search forcibly.

[Format]

Command  $\Delta$  [Axis] [CR]

OGE  $\Delta$   $\left. \begin{array}{l} X \\ Y \end{array} \right|$  [CR]

Multiple axes can be designated at a time.

Even though it is for 1-axis (MR210AU), be sure to input "X" for axis assignment.

[Example]

- In 2-axes, when the user wants to forcibly terminate a home search for both X and Y axes.

OGE  $\Delta$  XY [CR]

- In 1-axis, when the user wants to forcibly terminate a home search.

OGE  $\Delta$  X [CR]

## P S P

---

[Contents] Executing program is paused.

[Format]

Command  $\Delta$  [Axis] [CR]

$$\text{PSP } \Delta \left| \begin{array}{l} X \\ Y \end{array} \right| [\text{CR}]$$

After the current executing command finishes, it pauses. To restart the program, write PRS command. If the user wants to terminate the program from pause state, write EDP command.

Multiple axes can be designated at a time.

Even though it is for 1-axis (MR210AU), be sure to input "X" for axis assignment.

[Example]

- In 2-axes, when the user wants to pause the program for both X and Y axes.

P S P  $\Delta$  X Y [C R]

- In 1-axis, when the user wants to pause the program.

P S P  $\Delta$  X [C R]

## E D P

---

[Contents] Terminates a program forcibly.

[Format]

Command  $\Delta$  [Axis] [CR]

$$\text{EDP } \Delta \left| \begin{array}{l} X \\ Y \end{array} \right| [\text{CR}]$$

After the current command finishes, the program is forcibly terminated.

Multiple axes can be designated at a time.

Even though it is for 1-axis (MR210AU), be sure to input "X" for axis assignment.

[Example]

- In 2-axes, when the user wants to forcibly terminate the program for both X and Y axes.

E D P  $\Delta$  X Y [C R]

- In 1-axis, when the user wants to forcibly terminate the program.

E D P  $\Delta$  X [C R]

## P R S

---

[Contents] Restarts a program.

[Format]

Command  $\Delta$  [Axis] [CR]

$$\text{PRS } \Delta \left| \begin{array}{l} X \\ Y \end{array} \right| [\text{CR}]$$

When the user wants to restart the program from pause state, write this command.

Multiple axes can be designated at a time.

Even though it is for 1-axis (MR210AU), be sure to input "X" for axis assignment.

[Example]

- In 2-axes, when the user wants to restart both X and Y axes.

P R S  $\Delta$  X Y [C R]

- In 1-axis, when the user wants to restart an axis.

P R S  $\Delta$  X [C R]

## P S T

[Contents] Performs stepwise execution.

[Format]

Command  $\Delta$  [Axis] [Specified REG number] [CR]

PST  $\Delta$ 

X		○	○	[CR]
Y		Specified REG number		

Multiple axes can be designated at a time.

Even though it is for 1-axis (MR210AU), be sure to input "X" for axis assignment.

[Example]

- In 2-axes, when the user wants to perform stepwise execution for both X and Y axes.

PST  $\Delta$  XY○○ [CR]

- In 1-axis, when the user wants to perform stepwise execution.

PST  $\Delta$  X○○ [CR]

## E R D

[Contents] Reads error information.

[Format]

Command  $\Delta$  [Axis] [CR]

ERD  $\Delta$ 

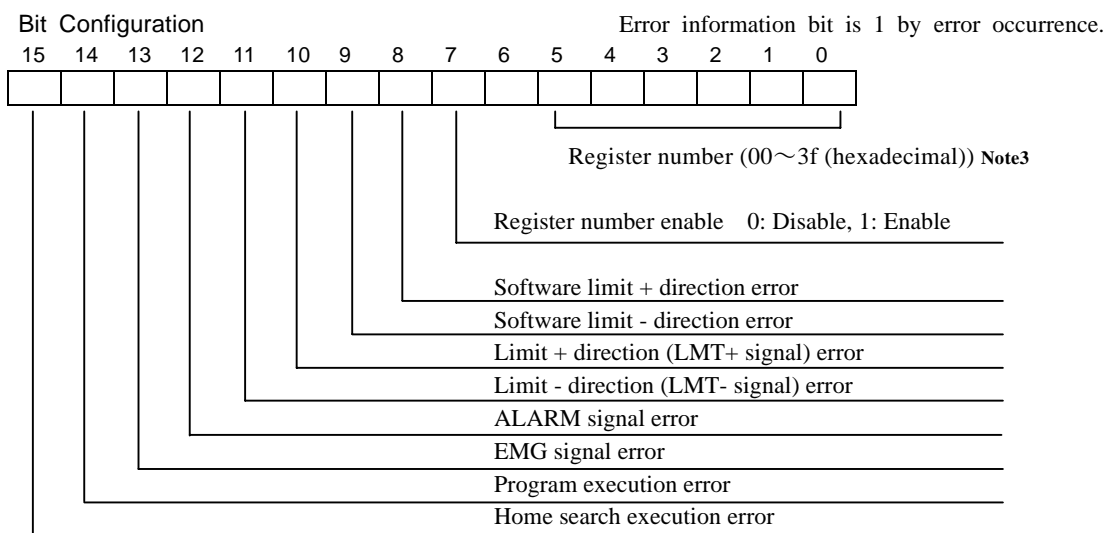
X		[CR]
Y		

Even though it is for 1-axis (MR210AU), be sure to input "X" for axis assignment.

[Response]

ERD  $\Delta$ 

X		○○○○	[CR]
Y		Error information of the motor control unit	



**Note3:** When Bit 7 (Register number value enable) is 1, the register number, which occurs an error, is displayed in Bit 5~0.