

Changes for the Better

MITSUBISHI CNC

EZMotion-NC E60/E68 Series

DDB INTERFACE MANUAL

Introduction

This manual describes the DDB (Direct Data Bus) function used to realize data input/output with a CNC while running a program developed with a EZMotion-NC E60/E68 user PLC (ladder language).







The methods for reading and writing various NC information using the DDB from a PLC are described in this manual.

Please read this manual before programming.

Please read the "Precautions for Safety" listed on the following page to ensure safe use of the EZMotion-NC E60/E68.

Details described in this manual

CAUTION

-  For items described in "Restrictions" or "Usable State", the instruction manual issued by the machine maker takes precedence over this manual.
-  Items not described in this manual must be interpreted as "not possible".
-  This manual is written on the assumption that all option functions are added. Refer to the specifications issued by the machine maker before starting use.
-  Refer to the Instruction Manual issued by each machine maker for details in each machine tool.
-  Some screens and functions may differ or may not be usable depending on the NC version.
-  Setting incorrect values could cause the machine to malfunction or run away. Take care when programming.

General precautions

The following documents are available as documents related to the contents of this manual. Refer to these as required.

PLC Programming Manual (Ladder section with MELSEC tool)	IB-1500178(ENG)
PLC Interface Manual	IB-1500176(ENG)
PLC Onboard Instruction Manual	IB-1500179(ENG)

Precautions for Safety

Always read the specifications issued by the machine maker, this manual, related manuals and enclosed documents before starting installation, operation, programming, maintenance or inspections to ensure correct use. Thoroughly understand the basics, safety information and precautions of this numerical controller before using the unit.

The safety precautions are ranked as "DANGER", "WARNING" and "CAUTION" in this manual.




When there is a great risk that the user could be subject to fatalities or serious injuries if handling is mistaken.



When the user could be subject to fatalities or serious injuries if handling is mistaken.



When the user could be subject to injuries or when physical damage could occur if handling is mistaken.

Note that even if the item is ranked as " CAUTION", incorrect handling could lead to serious results. Important information is described in all cases, so please observe the items.

DANGER







Not applicable in this manual.

WARNING

Not applicable in this manual.

CAUTION

1. Items related to product and manual

-  For items described as "Restrictions" or "Usable State" in this manual, the instruction manual issued by the machine maker takes precedence over this manual.
-  Items not described in this manual must be interpreted as "not possible".
-  This manual is written on the assumption that all option functions are added. Refer to the specifications issued by the machine maker before starting use.
-  Refer to the Instruction Manual issued by each machine maker for details in each machine tool.
-  Some screens and functions may differ or may not be usable depending on the NC version.
-  Setting incorrect values could cause the machine to malfunction or run away. Take care when programming.

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1. Outline

This manual describes the DDB (Direct Data Bus) function used to realize data input/output with a CNC while running a program developed with the user PLC ladder language.

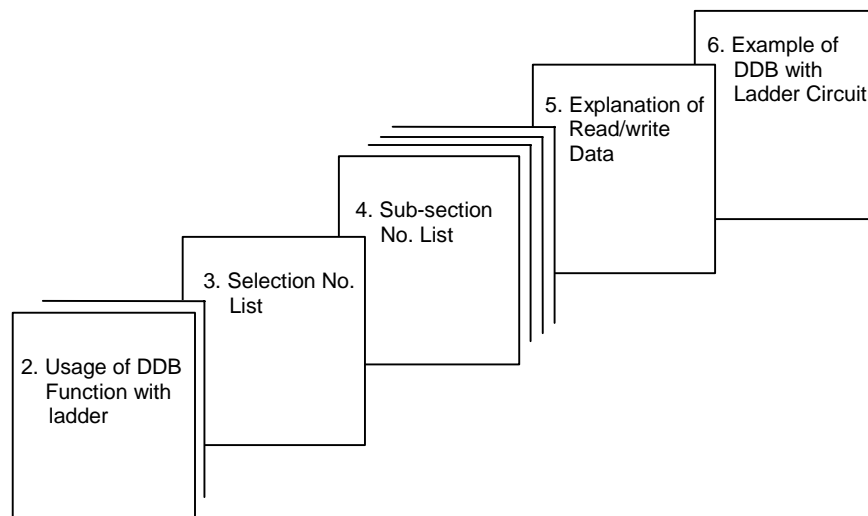
DDB includes the synchronous type (DDBS) and the asynchronous type (DDBA), but only the asynchronous type will be explained in this manual.

DDB is a function that allows the PLC to directly read and write the various data in the CNC. By setting the information required for reading and writing into the buffer and calling out the DDB function, the PLC can set (write) the designated data into the CNC. Generally, the data is read and written in one piece units, but data related to the control axis can be processed for the designated number of axes.

Features of this function include that the read data can be referred to in the step immediately following the execution of the DDBA command. This also applies to the written data.

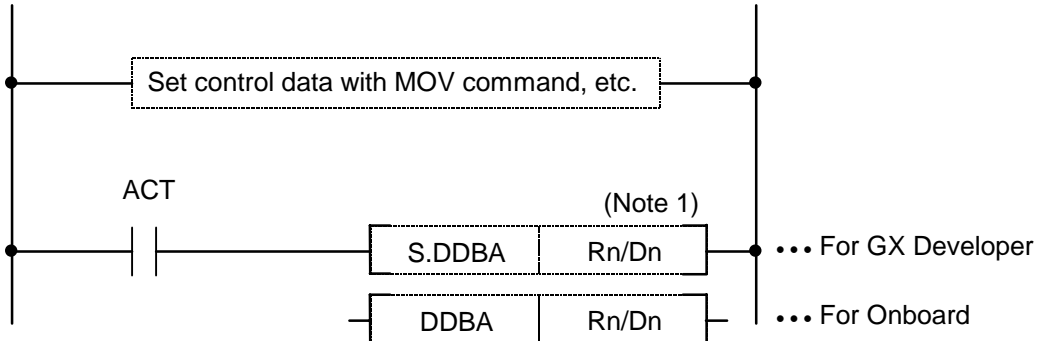
- (Note 1)** Note that for the parameters, they may not be valid immediately after writing.
- (Note 2)** Even for the parameters that will be valid immediately after writing, displaying the screen again may be required in order to reflect changes to the data displayed on the screen.
- (Note 3)** The functions related to the specifications not added to the NC cannot be used with the DDB.

This manual is organized in the following manner after the first chapter. Please refer to the required section for use.



2. Usage of DDB Function with Ladder

2.1 Basics of commands



(Note 1) The file registers (Rn) and data registers (Dn) in the range usable by the user can be used in the control data buffer of the asynchronous type DDB .

(Note 2) The examples of ladder circuit described after are for the GX Developer.

2.2 Basic format of control data

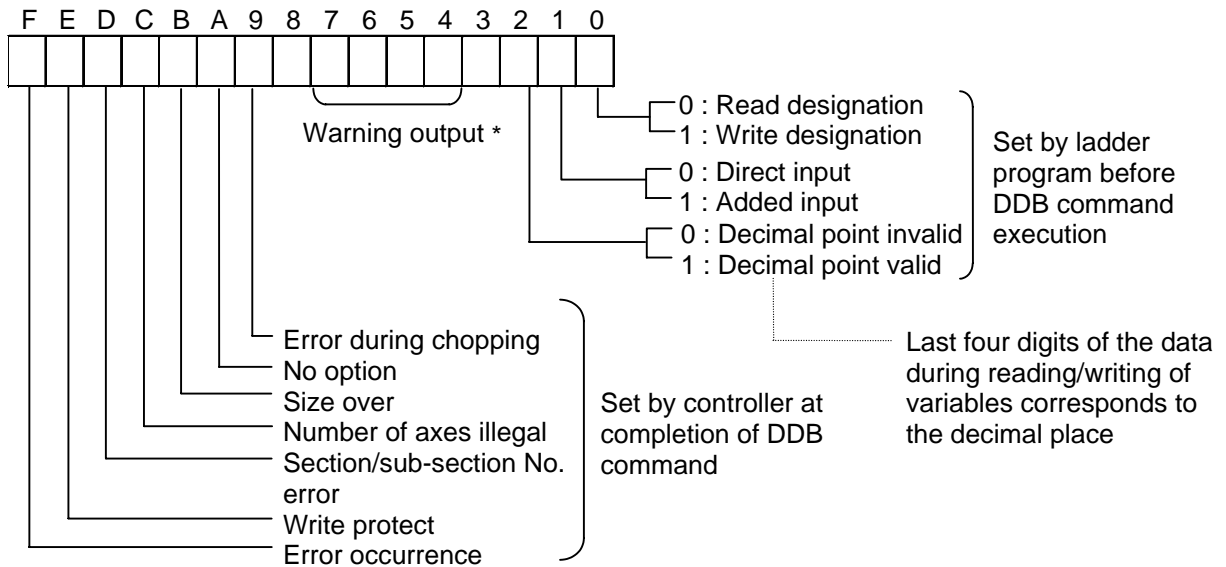
Rn	(Dn)	Control signal
Rn+1	(Dn+1)	Section No.
Rn+2	(Dn+2)	Sub-section No.
Rn+4	(Dn+4)	Data size
Rn+5	(Dn+5)	Read/write designated axis
Rn+6	(Dn+6)	Read/write data (for 1st axis)
Rn+8	(Dn+8)	(for 2nd axis)
Rn+10	(Dn+10)	(for 3rd axis)
		⋮
		⋮

(Note 1) Always secure 4 bytes as the buffer for one read/write data item.

For example, if only the 3rd axis is designated, the data for the 3rd axis will be the read/write data.

2. Usage of DDB Function with Ladder

2.2.1 Control signals (Rn or Dn)



2.2.2 Section No. (Rn+1 or Dn+1)

The section No. of the data to be read/written is designated with a binary. Refer to the "3. Section No. List" for details.

2.2.3 Sub-section No. (Rn+2, Rn+3 or Dn+2, Dn+3) (LOW HIGH)

The sub-section No. of the data to be read/written is designated with a binary. Refer to the "4. Sub-section No. List" for details.

2.2.4 Data size (Rn+4 or Dn+4)

The size of the data to be read/written is designated with a binary.

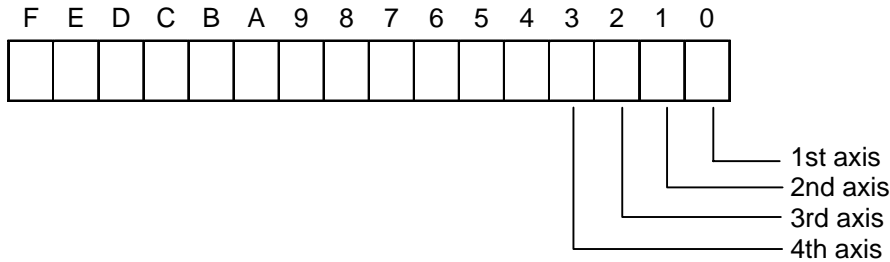
- 1: 1 byte
- 2: 2 bytes
- 4: 4 bytes

(Note) The date size has not been checked, so give an attention to data size when setting.

2. Usage of DDB Function with Ladder

2.2.5 Read/write designated axis (Rn+5 or Dn+5)

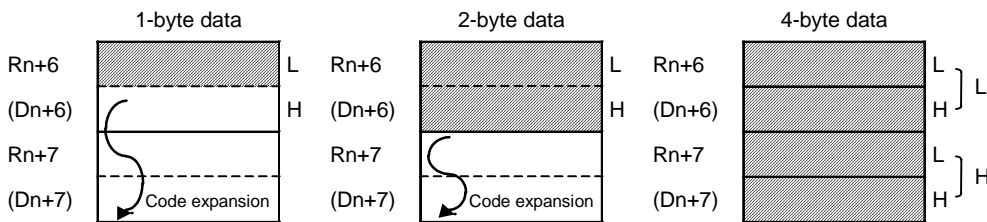
When reading or writing data per axis classified with the section No., designate the axis.



(Note 1) When reading and writing the axis data, if there is no axis designation or if the designation exceeds the maximum control axes, the alarm "No. of axes illegal" will occur.

2.2.6 Read/write data (Rn+6, Rn+7 or Dn+6, Dn+7) (LOW) (HIGH)

When read is designated, the data designated by the PLC will be output by the CNC.
When write is designated, the data to be written will be set by the PLC.



The valid area of the data will differ according to the data size. (Shaded area)

When read is designated, a code will be added to the 1-byte and 2-byte data to create a 4-byte data size. Thus, even when reading 1-byte or 2-byte data, 4 bytes are required for the buffer size.

2.2.7 Precautions

When starting up the DDB with PLC/APLC by using R registers, the 20 R registers, starting with the R register specified at the time of startup, are occupied in the system.
The R registers occupied in the system should not be used by the other DDB.

(Example) When the DDB is started from the PLC by using "DDBA R500", R500 to R519 are occupied in the system.

3. Section No. List

3. Section No. List

Section No.	Details	Write	Axis designation	Remarks
1	Parameters common to each axis	Possible (partially not possible)	Invalid	
2	Axis independent parameters	Possible (partially not possible)	Valid	
3	Machine error compensation information	Not possible (partially possible)	Invalid	
4	Workpiece coordinate system offset, external workpiece coordinate system offset	Possible	Valid	
5	Alarm information	Not possible	Invalid	
6				
7				
8				
9				
10				
11	Axis common non-modal information in block being executed	Not possible	Invalid	
12	Axis independent non-modal information in block being executed	Not possible	Valid	
13	Axis common modal information in block being executed	Not possible	Invalid	
14	Axis independent modal information in block being executed	Not possible	Valid	
15	Axis common non-modal information in next block	Not possible	Invalid	
16	Axis independent non-modal information in next block	Not possible	Valid	
17	Axis common modal information in next block	Not possible	Invalid	
18	Axis independent modal information in next block	Not possible	Valid	
19				
20	Axis common machine control information 1	Not possible	Invalid	
21	Axis independent machine control information 1	Not possible	Valid	
22	Information input from PLC to controller	Not possible	Invalid	
23	Information output from controller to PLC	Not possible	Invalid	
24	Cumulative time data	Possible	Invalid	
25				
26	Axis common machine control information 2	Not possible	Invalid	
27	Axis independent machine control information 2	Not possible	Valid	
28				
29	Common variable value 1	Possible	Invalid	From #500
30	Local variable value	Possible	Invalid	
31	Tool compensation amount	Possible	Invalid	
32	Common variable value 2	Possible	Invalid	From #100
180	J2-CT parameter	Possible (partially not possible)	Valid (partially invalid)	

4. Sub-section No. List

4. Sub-section No. List

The sub-section No. list shows the sub-section No. of each data in correspondence with the section No.

Each data has a search No. To refer to the contents of the data, search for the corresponding data in "5. Explanation of Read/Write Data" using this search No.

Search No.

4. Sub-section No. List

Section No.	1	Parameters common to each axis
--------------------	---	--------------------------------

Search No.	Data type	Sub-section No.	Size (bytes)	Write	Axis designation	Remarks
	Maximum spindle speed (Gear 1st step)	8960	4	Possible	Invalid	
1-10	Maximum spindle speed (Gear 2nd step)	8964	4	Possible	Invalid	
	Maximum spindle speed (Gear 3rd step)	8968	4	Possible	Invalid	
	Maximum spindle speed (Gear 4th step)	8972	4	Possible	Invalid	

1 - 10

→ No. of searching **(Note)** This is not the sub-section No.

→ Section No.

5. Explanation of Read/Write Data

1-10	Maximum spindle speed (Gear 1st step to gear 4th step)
------	--

[Data definition]

This is a parameter for the maximum spindle speed of each gear step.
 (This corresponds to the setup parameter, spindle parameter smax1 to 4.)
 The CNC creates the spindle gear shift command 1 and 2 based on this value and the commanded S command.
 During tapping, the maximum speed will be the spindle tap speed.

4. Sub-section No. List

Sub-section No. list

Section No.	1	Parameters common to each axis
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Search No.	Data type	Sub-section No.	Size (bytes)	Write	Axis designation	Remarks
1-10	Maximum spindle speed (Gear 1st step)	8960	4	Possible	Invalid	
	Maximum spindle speed (Gear 2nd step)	8964	4	Possible	Invalid	
	Maximum spindle speed (Gear 3rd step)	8968	4	Possible	Invalid	
	Maximum spindle speed (Gear 4th step)	8972	4	Possible	Invalid	
1-11	Spindle limit speed (Gear 1st step)	8976	4	Possible	Invalid	
	Spindle limit speed (Gear 2nd step)	8980	4	Possible	Invalid	
	Spindle limit speed (Gear 3rd step)	8984	4	Possible	Invalid	
	Spindle limit speed (Gear 4th step)	8988	4	Possible	Invalid	
1-13	Spindle shift speed (Gear 1st step)	9008	2	Possible	Invalid	
	Spindle shift speed (Gear 2nd step)	9010	2	Possible	Invalid	
	Spindle shift speed (Gear 3rd step)	9012	2	Possible	Invalid	
	Spindle shift speed (Gear 4th step)	9014	2	Possible	Invalid	
1-15	Monitor speed for speed monitoring (Spindle 1)	50223	2	Possible	Invalid	
	Monitor speed for speed monitoring (Spindle 2)	51223	2	Possible	Invalid	
1-20	Spindle orient speed	9024	2	Possible	Invalid	
1-21	Minimum spindle speed	9026	2	Possible	Invalid	
1-50	Method selection parameter (1) BIT0 : BIT1 : BIT2 : BIT3 : BIT4 : BIT5 : BIT6 : Synchronous tapping BIT7 :	195	1	Not possible	Invalid	
1-52	Method selection parameter (3) BIT0 : BIT1 : Tool compensation method (Tabsmv) BIT2 : BIT3 : BIT4 : BIT5 : BIT6 : BIT7 :	130	1	Possible	Invalid	
1-53	Method selection parameter (4) BIT0 : BIT1 : BIT2 : BIT3 : BIT4 : BIT5 : Reference point middle point ignore BIT6 : BIT7 :	194	1	Possible	Invalid	

4. Sub-section No. List

Search No.	Data type	Sub-section No.	Size (bytes)	Write	Axis designation	Remarks
1-54	Method selection parameter (5) BIT0 : Status trigger mode valid 1 : Interrupt type 2 valid 2 : 3 : 4 : 5 : 6 : 7 :	20081	1	Possible	Invalid	
1-55	Method selection parameter (6) BIT0 : Subprogram type call valid 1 : 2 : 3 : 4 : 5 : 6 : 7 :	20082	1	Possible	Invalid	
1-80	Alternate M code valid	20083	1	Possible	Invalid	
1-81	G0 non-interpolation	20084	1	Possible	Invalid	
1-90	Display language	69	1	Possible	Invalid	
1-91	Edit type	154	1	Possible	Invalid	
1-110	Input setupunit	20004	1	Possible	Invalid	Designate ASCII code with a hexadecimal
1-120	R COMP	20058	1	Possible	Invalid/Invalid	
1-121	DCC ANGLE	20059	1	Possible	Invalid/Invalid	
1-122	COMP CHANGE	20060	1	Possible	Invalid/Invalid	
1-123	CORNER COMP	20061	4	Possible	Invalid/Invalid	
1-124	CURVE COMP	20062	4	Possible	Invalid/Invalid	
1-140	Pre-interpolation acceleration/deceleration maximum speed	20071	4	Possible	Invalid	
1-141	Pre-interpolation acceleration/deceleration time constant	20072	2	Possible	Invalid	
1-160	Feed forward filter	20074	1	Possible	Invalid	

4. Sub-section No. List

Section No.	1
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Parameters common to each axis (Position switch)

Search No.	Data type	Sub-section No.	Size (bytes)	Write	Axis designation	Remarks	
1-200	Position switch [1]	axis	11984	1	Possible	Invalid	Designate ASCII code with a decimal
		dog 1	11968	4	Possible	Invalid	
		dog 2	11972	4	Possible	Invalid	
1-200	Position switch [2]	axis	12004	1	Possible	Invalid	Designate ASCII code with a decimal
		dog 1	11988	4	Possible	Invalid	
		dog 2	11992	4	Possible	Invalid	
1-200	Position switch [3]	axis	12024	1	Possible	Invalid	Designate ASCII code with a decimal
		dog 1	12008	4	Possible	Invalid	
		dog 2	12012	4	Possible	Invalid	
1-200	Position switch [4]	axis	12044	1	Possible	Invalid	Designate ASCII code with a decimal
		dog 1	12028	4	Possible	Invalid	
		dog 2	12032	4	Possible	Invalid	
1-200	Position switch [5]	axis	12064	1	Possible	Invalid	Designate ASCII code with a decimal
		dog 1	12048	4	Possible	Invalid	
		dog 2	12052	4	Possible	Invalid	
1-200	Position switch [6]	axis	12084	1	Possible	Invalid	Designate ASCII code with a decimal
		dog 1	12068	4	Possible	Invalid	
		dog 2	12072	4	Possible	Invalid	
1-200	Position switch [7]	axis	12104	1	Possible	Invalid	Designate ASCII code with a decimal
		dog 1	12088	4	Possible	Invalid	
		dog 2	12092	4	Possible	Invalid	
1-200	Position switch [8]	axis	12124	1	Possible	Invalid	Designate ASCII code with a decimal
		dog 1	12108	4	Possible	Invalid	
		dog 2	12112	4	Possible	Invalid	
1-200	Position switch [9]	axis	20010	1	Possible	Invalid	Designate ASCII code with a decimal
		dog1	20011	4	Possible	Invalid	
		dog2	20012	4	Possible	Invalid	
1-200	Position switch [10]	axis	20013	1	Possible	Invalid	Designate ASCII code with a decimal
		dog1	20014	4	Possible	Invalid	
		dog2	20015	4	Possible	Invalid	
1-200	Position switch [11]	axis	20016	1	Possible	Invalid	Designate ASCII code with a decimal
		dog1	20017	4	Possible	Invalid	
		dog2	20018	4	Possible	Invalid	
1-200	Position switch [12]	axis	20019	1	Possible	Invalid	Designate ASCII code with a decimal
		dog1	20020	4	Possible	Invalid	
		dog2	20021	4	Possible	Invalid	

4. Sub-section No. List

Search No.	Data type	Sub-section No.	Size (bytes)	Write	Axis designation	Remarks	
1-200	Position switch [13]	axis	20022	1	Possible	Invalid	Designate ASCII code with a decimal
		dog1	20023	4	Possible	Invalid	
		dog2	20024	4	Possible	Invalid	
1-200	Position switch [14]	axis	20025	1	Possible	Invalid	Designate ASCII code with a decimal
		dog1	20026	4	Possible	Invalid	
		dog2	20027	4	Possible	Invalid	
1-200	Position switch [15]	axis	20028	1	Possible	Invalid	Designate ASCII code with a decimal
		dog1	20029	4	Possible	Invalid	
		dog2	20030	4	Possible	Invalid	
1-200	Position switch [16]	axis	20031	1	Possible	Invalid	Designate ASCII code with a decimal
		dog1	20032	4	Possible	Invalid	
		dog2	20033	4	Possible	Invalid	
1-200	Position switch [17]	axis	20034	1	Possible	Invalid	Designate ASCII code with a decimal
		dog1	20035	4	Possible	Invalid	
		dog2	20036	4	Possible	Invalid	
1-200	Position switch [18]	axis	20037	1	Possible	Invalid	Designate ASCII code with a decimal
		dog1	20038	4	Possible	Invalid	
		dog2	20039	4	Possible	Invalid	
1-200	Position switch [19]	axis	20040	1	Possible	Invalid	Designate ASCII code with a decimal
		dog1	20041	4	Possible	Invalid	
		dog2	20042	4	Possible	Invalid	
1-200	Position switch [20]	axis	20043	1	Possible	Invalid	Designate ASCII code with a decimal
		dog1	20044	4	Possible	Invalid	
		dog2	20045	4	Possible	Invalid	
1-200	Position switch [21]	axis	20046	1	Possible	Invalid	Designate ASCII code with a decimal
		dog1	20047	4	Possible	Invalid	
		dog2	20048	4	Possible	Invalid	
1-200	Position switch [22]	axis	20049	1	Possible	Invalid	Designate ASCII code with a decimal
		dog1	20050	4	Possible	Invalid	
		dog2	20051	4	Possible	Invalid	
1-200	Position switch [23]	axis	20052	1	Possible	Invalid	Designate ASCII code with a decimal
		dog1	20053	4	Possible	Invalid	
		dog2	20054	4	Possible	Invalid	
1-200	Position switch [24]	axis	20055	1	Possible	Invalid	Designate ASCII code with a decimal
		dog1	20056	4	Possible	Invalid	
		dog2	20057	4	Possible	Invalid	

4. Sub-section No. List

Section No.	2
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Axis independent parameters

Search No.	Data type	Sub-section No.	Size (bytes)	Write	Axis designation	Remarks
2-10	1st reference point coordinates	272	4	Possible	Valid	
	2nd reference point coordinates	276	4	Possible	Valid	
	3rd reference point coordinates	280	4	Possible	Valid	
	4th reference point coordinates	284	4	Possible	Valid	
2-11	Stored stroke limit I (+)	288	4	Possible	Valid	For machine maker
	Stored stroke limit I (-)	292	4	Possible	Valid	For machine maker
2-20	Movement control parameters BIT0 : BIT1 : Inch output BIT2 : Reference point return direction (-) BIT3 : Servo OFF error compensation BIT4 : Rotary axis BIT5 : Motor CCW BIT6 : BIT7 : BIT8 : BIT9 : BITA : No reference point axis BITB : BITC : BITD : Diameter designated axis BITE : BITF :	20	2	Not possible	Valid	
2-30	Reference point return approach speed	38	2	Possible	Valid	
2-35	Reference point return shift amount	44	2	Possible	Valid	
2-36	Rapid traverse backlash amount	46	2	Possible	Valid	
2-37	Cutting feed backlash amount	48	2	Possible	Valid	
2-40	Stored stroke limit II (+)	656	4	Possible	Valid	For user
	Stored stroke limit II (-)	660	4	Possible	Valid	For user
2-50	Cutting feed time constant G1t	32	2	Possible	Valid	
2-51	Current limit value 2	122	2	Possible	Valid	
2-52	Current limit value 1	120	2	Possible	Valid	
2-60	Positive direction sensor of tool setter	20001	4	Possible	Valid	
2-61	Negative direction sensor of tool setter or TLM standard length	20002	4	Possible	Valid	
2-62	Feed forward gain	20004	2	Possible	Valid	
2-70	Minimum corner deceleration speed	20005	4	Possible	Valid	
2-80	Rapid traverse rate	20006	4	Possible	Valid	
2-90	G28 rapid traverse rate	20007	4	Possible	Valid	

4. Sub-section No. List

Section No.	3	Machine error compensation information
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Search No.	Data type	Sub-section No.	Size (bytes)	Write	Axis designation	Remarks
3-10	Compensation basic axis number	2	1	Not possible	Invalid	
3-11	Compensation direction axis number	6	1	Not possible	Invalid	
3-12	Division point number at reference position	10	2	Not possible	Invalid	
3-13	Division point number at the most negative side	14	2	Not possible	Invalid	
3-14	Division point number at the most positive side	18	2	Not possible	Invalid	
3-15	Compensation scale factor	20	2	Possible	Invalid	
3-16	Division interval	28	4	Possible	Invalid	

Section No.	4	Workpiece coordinate system offset, external workpiece coordinate system offset
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Search No.	Data type	Sub-section No.	Size (bytes)	Write	Axis designation	Remarks
4-10	G54 workpiece coordinate system offset	0	4	Possible	Valid	
4-11	G55 workpiece coordinate system offset	4	4	Possible	Valid	
4-12	G56 workpiece coordinate system offset	8	4	Possible	Valid	
4-13	G57 workpiece coordinate system offset	12	4	Possible	Valid	
4-14	G58 workpiece coordinate system offset	16	4	Possible	Valid	
4-15	G59 workpiece coordinate system offset	20	4	Possible	Valid	
4-16	External workpiece coordinate system offset	24	4	Possible	Valid	
4-17	Extended workpiece coordinate system offset [1]	20001	4	Possible	Valid	
4-17	Extended workpiece coordinate system offset [2]	20002	4	Possible	Valid	
4-17	Extended workpiece coordinate system offset [3]	20003	4	Possible	Valid	
4-17	Extended workpiece coordinate system offset [4]	20004	4	Possible	Valid	
4-17	Extended workpiece coordinate system offset [5]	20005	4	Possible	Valid	
4-17	Extended workpiece coordinate system offset [6]	20006	4	Possible	Valid	
4-17	Extended workpiece coordinate system offset [7]	20007	4	Possible	Valid	
4-17	Extended workpiece coordinate system offset [8]	20008	4	Possible	Valid	

4. Sub-section No. List

Search No.	Data type	Sub-section No.	Size (bytes)	Write	System/axis designation	Remarks
4-17	Extended workpiece coordinate system offset [9]	20009	4	Possible	Valid	
4-17	Extended workpiece coordinate system offset [10]	20010	4	Possible	Valid	
4-17	Extended workpiece coordinate system offset [11]	20011	4	Possible	Valid	
4-17	Extended workpiece coordinate system offset [12]	20012	4	Possible	Valid	
4-17	Extended workpiece coordinate system offset [13]	20013	4	Possible	Valid	
4-17	Extended workpiece coordinate system offset [14]	20014	4	Possible	Valid	
4-17	Extended workpiece coordinate system offset [15]	20015	4	Possible	Valid	
4-17	Extended workpiece coordinate system offset [16]	20016	4	Possible	Valid	
4-17	Extended workpiece coordinate system offset [17]	20017	4	Possible	Valid	
4-17	Extended workpiece coordinate system offset [18]	20018	4	Possible	Valid	
4-17	Extended workpiece coordinate system offset [19]	20019	4	Possible	Valid	
4-17	Extended workpiece coordinate system offset [20]	20020	4	Possible	Valid	
4-17	Extended workpiece coordinate system offset [21]	20021	4	Possible	Valid	
4-17	Extended workpiece coordinate system offset [22]	20022	4	Possible	Valid	
4-17	Extended workpiece coordinate system offset [23]	20023	4	Possible	Valid	
4-17	Extended workpiece coordinate system offset [24]	20024	4	Possible	Valid	
4-17	Extended workpiece coordinate system offset [25]	20025	4	Possible	Valid	
4-17	Extended workpiece coordinate system offset [26]	20026	4	Possible	Valid	
4-17	Extended workpiece coordinate system offset [27]	20027	4	Possible	Valid	
4-17	Extended workpiece coordinate system offset [28]	20028	4	Possible	Valid	
4-17	Extended workpiece coordinate system offset [29]	20029	4	Possible	Valid	
4-17	Extended workpiece coordinate system offset [30]	20030	4	Possible	Valid	

4. Sub-section No. List

Search No.	Data type	Sub-section No.	Size (bytes)	Write	System/axis designation	Remarks
4-17	Extended workpiece coordinate system offset [31]	20031	4	Possible	Valid	
4-17	Extended workpiece coordinate system offset [32]	20032	4	Possible	Valid	
4-17	Extended workpiece coordinate system offset [33]	20033	4	Possible	Valid	
4-17	Extended workpiece coordinate system offset [34]	20034	4	Possible	Valid	
4-17	Extended workpiece coordinate system offset [35]	20035	4	Possible	Valid	
4-17	Extended workpiece coordinate system offset [36]	20036	4	Possible	Valid	
4-17	Extended workpiece coordinate system offset [37]	20037	4	Possible	Valid	
4-17	Extended workpiece coordinate system offset [38]	20038	4	Possible	Valid	
4-17	Extended workpiece coordinate system offset [39]	20039	4	Possible	Valid	
4-17	Extended workpiece coordinate system offset [40]	20040	4	Possible	Valid	
4-17	Extended workpiece coordinate system offset [41]	20041	4	Possible	Valid	
4-17	Extended workpiece coordinate system offset [42]	20042	4	Possible	Valid	
4-17	Extended workpiece coordinate system offset [43]	20043	4	Possible	Valid	
4-17	Extended workpiece coordinate system offset [44]	20044	4	Possible	Valid	
4-17	Extended workpiece coordinate system offset [45]	20045	4	Possible	Valid	
4-17	Extended workpiece coordinate system offset [46]	20046	4	Possible	Valid	
4-17	Extended workpiece coordinate system offset [47]	20047	4	Possible	Valid	
4-17	Extended workpiece coordinate system offset [48]	20048	4	Possible	Valid	

4. Sub-section No. List

Section No.	5	Alarm information
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Search No.	Data type	Sub-section No.	Size (bytes)	Write	Axis designation	Remarks	
5-30	Servo alarm No.	Main	16	2	Not possible	Invalid	
		Attribute (bit F)	18	2	Not possible	Invalid	(0-Invalid, 1-Valid)
		Sub 1	20	2	Not possible	Invalid	
		Sub 2	22	2	Not possible	Invalid	
5-90	Servo warning No.	Main	64	2	Not possible	Invalid	
		Attribute (bit F)	66	2	Not possible	Invalid	(0-Invalid, 1-Valid)
		Sub 1	68	2	Not possible	Invalid	
		Sub 2	70	2	Not possible	Invalid	
5-130	Operation error No.	Main	96	2	Not possible	Invalid	
		Attribute (bit F)	98	2	Not possible	Invalid	(0-Invalid, 1-Valid)
		Sub 1	100	2	Not possible	Invalid	
		Sub 2	102	2	Not possible	Invalid	
5-140	Automatic stop code	Main	104	2	Not possible	Invalid	
		Attribute (bit F)	106	2	Not possible	Invalid	(0-Invalid, 1-Valid)
		Sub 1	108	2	Not possible	Invalid	
		Sub 2	110	2	Not possible	Invalid	

4. Sub-section No. List

Section No.	ACT 13 PCB 17
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Axis common modal information in block being executed (ACT) and in next block (PCB)

Search No.	Data type	Sub-section No.	Size (bytes)	Write	Axis designation	Remarks
13/17-10	G code (group 1)	0	1	Not possible	Invalid	Interpolation mode
13/17-11	G code (group 2)	1	1	Not possible	Invalid	Plane selection
13/17-12	G code (group 5)	2	1	Not possible	Invalid	Feed mode
13/17-13	G code (group 7)	3	1	Not possible	Invalid	Radius compensation modal
13/17-14	G code (group 9)	4	1	Not possible	Invalid	Fixed cycle modal
13/17-15	G code (group 12)	5	1	Not possible	Invalid	Workpiece coordinate system modal
13/17-16	G code (group 13)	6	1	Not possible	Invalid	Cutting mode
13/17-17	G code (group 3, 4, 6, 10, 17, 18) BIT0 : Absolute/incremental mode BIT1 : Barrier check BIT2 : Inch/metric mode BIT3 : Fixed cycle R point return BIT4 : BIT5 : Constant surface speed control BIT6 : BIT7 :	7	1	Not possible	Invalid	
13/17-20	Block No.	15	1	Not possible	Invalid	0 to 99
13/17-30	Shape compensation No.	76	2	Not possible	Invalid	
13/17-31	Wear compensation No.	78	2	Not possible	Invalid	
13/17-40	Miscellaneous function code	208	4	Not possible	Invalid	M code (binary)
13/17-41	Spindle function code	212	4	Not possible	Invalid	S code (binary)
13/17-42	Tool function code	216	4	Not possible	Invalid	T code (binary)
13/17-43	2nd miscellaneous function code	220	4	Not possible	Invalid	B code (binary)
13/17-44	Program No.	240	4	Not possible	Invalid	O 1 to 99999999
13/17-45	Sequence No.	244	4	Not possible	Invalid	N 1 to 99999
13/17-50	Tool radius compensation amount and nose R compensation amount of the 1st axis in plane selection	20001	4	Not possible	Invalid	I
13/17-50	Tool radius compensation amount and nose R compensation amount of the 2nd axis in plane selection	20002	4	Not possible	Invalid	J
13/17-50	Tool radius compensation amount and nose R compensation amount of the 3rd axis in plane selection	20003	4	Not possible	Invalid	K

4. Sub-section No. List

Section No.	ACT 14 PCB 18
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Axis independent modal information in block being executed (ACT) and in next block (PCB)

Search No.	Data type	Sub-section No.	Size (bytes)	Write	Axis designation	Remarks
14/18-10	Tool length compensation No.	112	2	Not possible	Valid	Machining center system only
14/18-20	Workpiece offset amount	20001	4	Not possible	Valid	
14/18-21	Tool length compensation amount	20002	4	Not possible	Valid	Machining center system only
14/18-22	Tool length shape offset amount	20003	4	Not possible	Valid	Lathe type only
14/18-23	Tool length compensation amount	20004	4	Not possible	Valid	Lathe type only
14/18-24	Tool wear compensation amount	20005	4	Not possible	Valid	Lathe type only

4. Sub-section No. List

Section No.	20
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Axis common machine control information 1

Search No.	Data type	Sub-section No.	Size (bytes)	Write	Axis designation	Remarks
20-10	Automatic effective feedrate	84	4	Not possible	Invalid	Effective speed of feed direction
20-11	Manual effective feedrate	88	4	Not possible	Invalid	Effective speed of axis direction
20-20	In-position	4	2	Not possible	Invalid	

Section No.	21
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Axis independent machine control information 1

Search No.	Data type	Sub-section No.	Size (bytes)	Write	Axis designation	Remarks
21-10	Current position in machine coordinate system (Machine position)	0	4	Not possible	Valid	
21-12	Manual interrupt amount (1)	8	4	Not possible	Valid	When manual ABS switch is OFF
21-13	Manual interrupt amount (2)	12	4	Not possible	Valid	When manual ABS switch is ON
21-20	Current position in workpiece coordinate system	36	4	Not possible	Valid	
21-30	Current position in workpiece coordinate system during skip ON	112	4	Not possible	Valid	
21-31	Current position in machine coordinate system during skip ON	116	4	Not possible	Valid	
21-32	Remaining distance during skip ON	120	4	Not possible	Valid	
21-34	Command position in machine coordinate system	20007	4	Not possible	Valid	
21-40	Relative value	20001	4	Not possible	Valid	
21-41	Current value B	20003	4	Not possible	Valid	
21-42	Axis name	20004	4	Not possible	Valid	Designate ASCII code with a hexadecimal
21-43	Increment command axis name	20005	4	Not possible	Valid	Designate ASCII code with a hexadecimal
21-44	2nd axis name	20006	4	Not possible	Valid	Designate ASCII code with a hexadecimal

4. Sub-section No. List

Section No.	22
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Information input from PLC to controller

Search No.	Data type	Sub-section No.	Size (bytes)	Write	Axis designation	Remarks
22-10	Emergency stop causes BIT0 : Built-in PLC Stop state BIT1 : - - BIT2 : - - BIT3 : - - BIT4 : Control unit EMG connector Emergency stop state BIT5 : BIT6 : Built-in PLC Software emergency stop output device Y29F is "1". BIT7 : BIT8 : BIT9 : BITA : BITB : User PLC Illegal codes exist. BITC : PLC high-speed processing error BITD : Door interlock, dog/OT arbitrary allocation device illegal BITE : Spindle drive unit emergency stop output BITF : Servo drive unit emergency stop output	0	2	Not possible	Invalid	

Section No.	23
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Information output from controller to PLC

Search No.	Data type	Sub-section No.	Size (bytes)	Write	Axis designation	Remarks
23-10	Spindle command speed (effective value)	48	4	Not possible	Invalid	Including override

Section No.	24
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Cumulative time data

Search No.	Data type	Sub-section No.	Size (bytes)	Write	Axis designation	Remarks
24-1	Power ON time	0	4	Possible	Invalid	
24-2	Automatic operation time	4	4	Possible	Invalid	
24-3	Automatic start up time	8	4	Possible	Invalid	
24-4	External cumulative time 1	12	4	Possible	Invalid	
24-5	External cumulative time 2	16	4	Possible	Invalid	

4. Sub-section No. List

Section No.	26
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Axis common machine control information 2

Search No.	Data type	Sub-section No.	Size (bytes)	Write	Axis designation	Remarks
26-10	1st spindle Motor real speed	8992	4	Not possible	Invalid	Including override
26-20	1st spindle Motor load	8988	2	Not possible	Invalid	
26-10	2nd spindle Motor real speed	7712	4	Not possible	Invalid	Including override
26-20	2nd spindle Motor load	7708	2	Not possible	Invalid	

Section No.	27
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Axis independent machine control information 2

Search No.	Data type	Sub-section No.	Size (bytes)	Write	Axis designation	Remarks
27-10	Smoothing status, servo status BIT0 : Ready ON BIT1 : Servo ON BIT2 : In emergency stop BIT3 : In alarm BIT4 : Absolute position established BIT5 : Z phase passed BIT6 : In-position BIT7 : Torque limit BIT8 : Smoothing 0 BIT9 : Smoothing+ BITA : Smoothing - BITB : BITC : Hardware OT+ BITD : Hardware OT- BITE : Near-point dog ON BITF : Amp. unequipped	74	2	Not possible	Valid	
27-20	Servo delay amount	308	4	Not possible	Valid	
27-30	Feed axis motor load A (%)	328	2	Not possible	Valid	
27-31	Feed axis motor load B (%)	330	2	Not possible	Valid	
27-33	Feed axis motor speed (r/min)	312	2	Not possible	Valid	

4. Sub-section No. List

Section No.	29
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Common variable value 1

Search No.	Data type	Sub-section No.	Size (bytes)	Write	Axis designation	Remarks
29-10	Variable command 200 sets	500 to 599	4	Possible	Invalid	

Section No.	30
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Local variable value

Search No.	Data type	Sub-section No.	Size (bytes)	Write	Axis designation	Remarks
30-10	Local variables (level 0)	1 to 32	4	Possible	Invalid	
30-11	Local variables (level 1)	101 to 132	4	Possible	Invalid	
30-12	Local variables (level 2)	201 to 232	4	Possible	Invalid	
30-13	Local variables (level 3)	301 to 332	4	Possible	Invalid	
30-14	Local variables (level 4)	401 to 432	4	Possible	Invalid	

Section No.	31
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Tool compensation amount

Search No.	Data type	Sub-section No.	Size (bytes)	Write	Axis designation	Remarks
31-10	Tool compensation amount 1	1 to 400	4	Possible	Invalid	The contents will differ according to the type of tool offset memory.
31-20	Tool compensation amount 2	1001 to 1400	4	Possible	Invalid	
31-30	Tool compensation amount 3	6001 to 6400	4	Possible	Invalid	
31-40	Tool compensation amount 4	7001 to 7400	4	Possible	Invalid	
31-100	X axis tool length compensation amount	1 to 40	4	Possible	Invalid	The contents will differ according to the type of tool offset memory.
31-110	X axis wear compensation amount	1001 to 1040	4	Possible	Invalid	
31-120	3rd axis tool length compensation amount	2001 to 2040	4	Possible	Invalid	
31-130	3rd axis wear compensation amount	3001 to 3040	4	Possible	Invalid	
31-140	Z axis tool length compensation amount	4001 to 4040	4	Possible	Invalid	
31-150	Z axis wear compensation amount	5001 to 5040	4	Possible	Invalid	
31-160	Nose R compensation amount	6001 to 6040	4	Possible	Invalid	
31-170	Nose R wear compensation amount	7001 to 7040	4	Possible	Invalid	
31-180	Hypothetical nose No.	8001 to 8040	1	Possible	Invalid	

Section No.	32
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Common variable value 2

Search No.	Data type	Sub-section No.	Size (bytes)	Write	Axis designation	Remarks
32-10	Variable command 200 sets	100 to 199	4	Possible	Invalid	

4. Sub-section No. List

Section No.	180	J2-CT parameter
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Search No.	Data type	Sub-section No.	Size (bytes)	Write	Axis designation	Remarks
180-10	station: No. of indexing stations	18	2	Possible	Valid	Auxiliary axis parameter #100
180-11	Cont1: Control parameter 1	2	2	Possible	Valid	Auxiliary axis parameter #101
180-12	Cont2: Control parameter 2	1	1	Possible	Valid	Auxiliary axis parameter #102
180-13	Emgcont: Emergency stop control	10	1	Possible	Valid	Auxiliary axis parameter #103
180-14	tleng: Linear axis stroke length	36	4	Possible	Valid	Auxiliary axis parameter #104
180-15	ZRNspeed: Reference point return speed	64	4	Possible	Valid	Auxiliary axis parameter #110
180-16	EZRNcreep: Reference point return creep speed	26	2	Possible	Valid	Auxiliary axis parameter #111
180-17	grid mask: Grid mask	24	2	Possible	Valid	Auxiliary axis parameter #112
180-18	grspc: Grid spacing	13	1	Possible	Valid	Auxiliary axis parameter #113
180-19	ZRNshift: Reference point shift amount	30	2	Possible	Valid	Auxiliary axis parameter #114
180-20	ST.offset: Station offset	60	4	Possible	Valid	Auxiliary axis parameter #115
180-21	ABSBase: Absolute position zero point	52	4	Possible	Valid	Auxiliary axis parameter #116
180-22	Limit(+): Soft limit (+)	44	4	Possible	Valid	Auxiliary axis parameter #117
180-23	Limit(-): Soft limit (-)	56	4	Possible	Valid	Auxiliary axis parameter #118
180-24	ABStype: Absolute position detection parameter	0	1	Possible	Valid	Auxiliary axis parameter #120
180-25	ABS check: Absolute position power OFF tolerable movement value	48	4	Possible	Valid	Auxiliary axis parameter #123
180-26	backlash: Backlash compensation amount	28	2	Possible	Valid	Auxiliary axis parameter #130
180-40	J2-CTstatus	65536 (0x00010000)	4	Not possible	Invalid (One axis designation)	

(Note) Multiple axes can be designated when reading, but only one axis can be designated for writing.

5. Explanation of Read/Write Data

5.1 How to refer to the data

The explanation of the read and write data is common for all machine type. The method for referring to the data is shown below.

4. Sub-section No. List

Section No.	1	Parameters common to each axis				
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Search No.	Data type	Sub-section No.	Size (bytes)	Write	Axis designation	Remarks
←(1)	Maximum spindle speed (Gear 1st step) →(1)	8960	4	Possible	Invalid	
(2)↓	Maximum spindle speed (Gear 2nd step)	8964	4	Possible	Invalid	
-1-10	Maximum spindle speed (Gear 3rd step)	8968	4	Possible	Invalid	
	Maximum spindle speed (Gear 4th step)	8972	4	Possible	Invalid	
1-11	Spindle limit speed (Gear 1st step)	8976	4	Possible	Invalid	
	Spindle limit speed (Gear 2nd step)	8980	4	Possible	Invalid	
	Spindle limit speed (Gear 3rd step)	8984	4	Possible	Invalid	
	Spindle limit speed (Gear 4th step)	8988	4	Possible	Invalid	
⋮	⋮	⋮	⋮	⋮	⋮	

5. Explanation of Read/Write Data

1-10	Maximum spindle speed (Gear 1st step to gear 4th step)
------	--

[Data definition]
 This is a parameter for the maximum spindle speed of each gear step.
 (This corresponds to the setup parameter, spindle parameter smax1 to 4.)
 The CNC creates the spindle gear shift command 1 and 2 with this value and the commanded S command.
 During tapping, the maximum speed will be the spindle tap speed.

[Data unit, range]
 The data unit is r/min, and the setting range is 0 to 99999 (binary).

[Precaution]
 After being set (written), this data is valid from the next spindle speed (S) command.
 However, the clamping operation with the maximum speed will be validated immediately.

- (1) Search for the data to be read or written from the type of data given in the "Sub-section No. List" of the target model.
- (2) Confirm the search No. corresponding to the searched data.
- (3) Search for the reference data from the "5. Explanation of Read/Write Data" based on the confirmed search No.

(Note 1) Note that the first value of the search No. (for example, 1-10) is the section No., but the second value is not the sub-section No.

(Note 2) The expression "1-50-6" in the read/write data explanation indicates section No. : 1, search No.: 50 and bit: 6.

(Note 3) The search No. expressed as "11/15-10" in the read/write data explanation indicates that the contents are common to the data in section No.:11, search No.: 10, and the data in section No.: 15 and search No.: 10.

5. Explanation of Read/Write Data

5.2 Data unit system

The unit system indicated in this manual is shown below.

Unit system		B(1 μm system)	C(0.1 μm system)	Selection parameter
Input unit	mm	0.001	0.0001	Setup parameter Basic specification parameter #1041 I_inch = 0
	inch	0.0001	0.00001	Setup parameter Basic specification parameter #1041 I_inch = 1
Output unit (Detection unit)	mm	0.0005	0.00005	Setup parameter Basic specification parameter #1061 iout = 0
	inch	0.00005	0.000005	Setup parameter Basic specification parameter #1061 iout = 1
Machine constant input unit	mm	0.001	0.0001	Setup parameter Basic specification parameter #1040 M_inch = 0
	inch	0.0001	0.00001	Setup parameter Basic specification parameter #1040 M_inch = 1

- (Note 1)** The unit systems B and C are settings for the setup parameters (basic specification parameters: #1003 iunit). This may differ according to the machine type.
- (Note 2)** Of the selection parameters, #1041 I_inch and #1040 M_inch are common for each axis, and #1061 iout is for the independent axis.
- (Note 3)** The data is read and written in the internal unit.

5.3 Explanation of data details

The details of the data that are read or written with the DDB are explained below.

1-10	Maximum spindle speed (Gear 1st step to gear 4th step)
-------------	---

[Data definition]

This is a parameter for the maximum spindle speed of each gear step.
 (This corresponds to the setup parameter, spindle parameter "#3005 smax1" to "#3008 smax4".)
 The CNC creates the spindle gear shift command 1 and 2 with this value and the commanded S command.
 During tapping, the maximum speed will be the spindle tap speed.

[Data unit, range]

The data unit is r/min, and the setting range is 0 to 99999 (binary).

[Precaution]

After being set (written), this data is valid from the next spindle speed (S) command.
 However, the clamping operation with the maximum speed will be validated immediately.

1-11	Spindle limit speed (Gear 1st step to gear 4th step)
-------------	---

[Data definition]

This parameter is used to calculate the spindle speed (S-analog) data for each gear step.
 (This corresponds to the setup parameter, spindle parameter "#3001 slimt1" to "#3004 slimt4".)
 The CNC determines the corresponding spindle limit speed with the spindle gear selection input (Y...) output from the PLC, and calculates the spindle speed (S-analog) data.

$$\text{Spindle speed data} = \frac{Sd_1d_2d_3d_4}{\text{slimt } n} \times \frac{\text{SOVR}}{100}$$

- slimt n : Spindle limit speed of corresponding gear step determined with spindle gear selection input. (n: 1~4)
- Sd₁d₂d₃d₄ : Spindle speed (S) command
- SOVR : Spindle override

[Data unit, range]

The data unit is r/min, and the setting range is 0 to 99999 (binary).

[Precaution]

This setting is validated immediately after setting (writing).

5. Explanation of Read/Write Data

1-13	Spindle shift speed (Gear 1st step to gear 4th step)
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[Data definition]

When changing the spindle gears, the spindle motor is run slowly at a constant speed to make the changeover operation smooth. This parameter is used to designate the speed at that time. (This corresponds to the setup parameter, spindle parameter "#3009 ssift1" to "#3012 ssift4".)
The CNC determines the corresponding spindle shift speed with the spindle gear selection input (Y...) output from the PLC.

$$\text{Spindle speed data for gear shift} = \frac{\text{ssift } n}{\text{slimt } n}$$

- slimt n : Spindle limit speed of corresponding gear step determined with spindle gear selection input (n: 1~4)
ssift n : Spindle shift speed of corresponding gear step determined with spindle gear selection input

[Data unit, range]

The data unit is r/min, and the setting range is 0 to 32767 (binary).

[Precaution]

This setting is validated immediately after setting (writing).

1-15	Monitor speed for speed monitoring (Spindle 1 to 2)
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[Data definition]

Set the spindle limit speed in the door open state. (Invalid when 0 is set.)
If the spindle end speed exceeds this setting value when the door is open, the speed monitor error (5E) will occur.
(This corresponds to the setup parameter, spindle parameter "#3423 SP223".)

[Data unit, range]

The data unit is r/min, and the setting range is 0 to 800 (binary).

5. Explanation of Read/Write Data

1-20	Spindle orient speed
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[Data definition]

This parameter is used to rotate the spindle at a slow constant speed when carrying out spindle orientation (orient position stop).

(This corresponds to the setup parameter, spindle parameter "#3021 sori".)

$$\text{Spindle speed data for orient} = \frac{\text{sori}}{\text{slimt } n}$$

sori : Spindle orient speed

slimt n : Spindle limit speed of corresponding gear step determined with spindle gear selection input (n: 1~4)

[Data unit, range]

The data unit is r/min, and the setting range is 0 to 32767 (binary).

[Precaution]

This setting is validated immediately after setting (writing).

5. Explanation of Read/Write Data

1-21	Minimum spindle speed
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[Data definition]

This parameter specifies the minimum spindle speed value.

If the S command issued is a spindle speed lower than this parameter value or if the results of the spindle override are lower than this parameter value, the spindle will be rotated at this minimum spindle speed.

(This corresponds to the setup parameter, spindle parameter "#3023 smini".)

[Data unit, range]

The data unit is r/min, and the setting range is 0 to 32767 (binary).

[Precaution]

This setting is validated immediately after setting (writing).

1-50	Method selection parameter (1)
------	--------------------------------

[Data definition]

The following parameters are indicated in bit units.

[Data range]

The setting range is 0 to 255 (binary).

The set data could affect the other bits, so take care when setting.

1-50-6) Synchronous tapping

This parameter is used when carrying out the machining program's tapping cycle (G84, G74) with the synchronous method.

0 : Asynchronous method

1 : Synchronous method

(This corresponds to the setup parameter, basic specification parameter "#1229 set01".)

1-52	Method selection parameter (3)
------	--------------------------------

[Data definition]

The following parameters are set in bit units.

[Data range]

The setting range is 0 to 255 (binary).

The set data could affect the other bits, so take care when setting.

1-52-1) Tool compensation method Valid only for lathe (L) system

The type of movement command for when the tool compensation operation (Tmove) is set to "1" is designated.

0 : Compensation is carried out regardless of the movement command type.

1 : Compensation is carried out only for a movement command issued with an absolute value.

(This corresponds to the setup parameter, basic specification parameter "#1101 Tabsmv".)

5. Explanation of Read/Write Data

1-53	Method selection parameter (4)
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[Data definition]

The following parameters are set in bit units.

[Data range]

The setting range is 0 to 255 (binary).

The set data could affect the other bits, so take care when setting.

1-53-5) Reference point middle point ignored

This parameter designates how to handle the middle point during G28 and G30 reference point return.

0 : Move to the reference point via the middle point designated in the program.

1 : Ignore the middle point designated in the program, and move directly to the reference point.

(This corresponds to the setup parameter, basic specification parameter "#1091 Mpoint".)

1-54	Method selection parameter (5)
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[Data definition]

The following parameters are set in bit units.

[Data unit, range]

The setting range is 0 to 255 (binary).

The set data could affect the other bits, so take care when setting.

1-54-0) Status trigger mode valid

Specify the validity conditions for the user macro interrupt signal (UIT).

0 : Valid when interrupt signal turns OFF to ON.

1 : Valid when interrupt signal is ON.

(This corresponds to the setup parameter, basic specification parameter "#1112 S_TRG".)

1-54-1) Interrupt type 2 valid

Specify the movement after user macro interrupt signal (UIT) input.

0 : Execute interrupt program without waiting for block being executed to end.

1 : Execute interrupt program after completing block being executed.

(This corresponds to the setup parameter, basic specification parameter "#1113 INT_2".)

1-55	Method selection parameter (6)
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[Data definition]

The following parameters are set in bit units.

[Data unit, range]

The setting range is 0 to 255 (binary).

The set data could affect the other bits, so take care when setting.

1-55-0) Subprogram type interrupt

The type of user macro interrupt is selected.

0 : Macro type user macro interrupt

1 : Subprogram type user macro interrupt

(This corresponds to the setup parameter, basic specification parameter "#1229 set01/bit0".)

5. Explanation of Read/Write Data

1-80	Alternate M code valid
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[Data definition]

Select the user macro interrupt with the alternate M code.

[Data unit, range]

0 : Alternate M code invalid

1 : Alternate M code valid

(This corresponds to the setup parameter, basic specification parameter "#1109 subs_M".)

1-81	G0 non-interpolation
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[Data definition]

Specify the G00 movement path type.

[Data unit, range]

0 : Move linearly toward the end point. (interpolation type)

1 : Move to the end point of each axis at the rapid traverse federate for each axis.
(non-interpolation type)

(This corresponds to the setup parameter, basic specification parameter "#1086 G0Intp".)

1-90	Display language
-------------	-------------------------

[Data definition]

Specify the display language.

(This corresponds to the setup parameter, basic specification parameter "#1043 lang".)

0: Japanese display

1: English display

2: Third language displayed ^{(Precaution (1))}

3: Fourth language displayed ^{(Precaution (1))}

11: Display in German

12: Display in French

13: Display in Italian

14: Display in Spanish

15: Display in Chinese (traditional Chinese)

16: Display in Korean

17: Display in Portuguese

18: Display in Dutch

19: Display in Swedish

20: Display in Hungarian

22: Display in Chinese (simplified Chinese)

[Precaution]

(1) If no character package is available for a specified language, the screen is displayed in English.

(2) This setting is validated immediately after setting (writing).

5. Explanation of Read/Write Data

1-91	Edit type
------	-----------

[Data definition]

Set up an edit type.

(This corresponds to the setup parameter, basic specification parameter "#1139 edtype".)

0: Screen edit type (M50 or equivalent operation)

1: Screen edit type

(The screen of EDIT or MDI is changed automatically according to the selected operation mode.)

2: Word edit type

(The screen of EDIT or MDI is changed automatically according to the selected operation mode.)

3: Screen edit type (type 0 + retaining cursor position)

4: Screen edit type (type 1 + retaining cursor position)

[Precaution]

This setting is validated immediately after setting (writing).

1-110	Input setting unit
-------	--------------------

[Data definition]

This parameter sets the input setting unit.

The parameter units will follow this specification.

(This corresponds to the setup parameter, basic specification parameter "#1003 iunit".)

[Data unit, range]

B: 1 μ m, C: 0.1 μ m

Set as a hexadecimal ASCII code.

[Precaution]

This setting is validated when the power is turned ON and OFF after setting (writing).

1-120	R COMP
-------	--------

[Data definition]

This parameter sets the compensation coefficient for further reducing the control error such as corner rounding or arc radius decrease.

The larger the setup value, the smaller the theoretical error will be. However, since the speed at the corner goes down, the cycle time is extended.

Coefficient = 100 – setting value

(Note) This is valid when "#8021 COMP CHANGE" is set to "0".

(This corresponds to the machining parameter "#8019 R COMP".)

[Data unit, range]

Set with a % unit within the range of 0 to 99.

[Precaution]

This parameter is validated immediately after setting (writing).

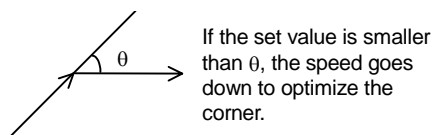
However, if it is changed during the high-accuracy modal, the operation will not be guaranteed.

5. Explanation of Read/Write Data

1-121	DCC ANGLE
-------	-----------

[Data definition]

This parameter sets the minimum unit of the angle (external angle) interpreted as a corner. When an inter-block angle (external angle) in high-accuracy mode is larger than the set value, it is determined as a corner and the speed goes down to sharpen the edge.



(This corresponds to the machining parameter "#8020 DCC ANGLE".)

[Data unit, range]

Set with a degree($^{\circ}$). unit within the range of 0 to 89.
If 0 is set, the same operation as when 5 is set will take place.

[Precaution]

This parameter is validated immediately after setting (writing).
However, if it is changed during the high-accuracy modal, the operation will not be guaranteed.

1-122	COMP CHANGE
-------	-------------

[Data definition]

This parameter selects whether to share or separate the compensation coefficients at the corner/curve during the high-accuracy control mode.

0 : Share (R COMP)

1 : Separate Corner (CORNER COMP), Curve (CURVE COMP)

(This corresponds to the machining parameter "#8021 COMP CHANGE".)

[Data unit, range]

Set within the range of 0 to 1.

[Precaution]

This parameter is validated immediately after setting (writing).
However, if it is changed during the high-accuracy modal, the operation will not be guaranteed.

1-123	CORNER COMP
-------	-------------

[Data definition]

This parameter sets the compensation coefficient for further reducing/enlarging the roundness at the corner during the high-accuracy control mode.

Coefficient = 100 - setting value

(Note) This is valid when "#8021 COMP CHANGE" is set to "1".

(This corresponds to the machining parameter "#8022 CORNER COMP".)

[Data unit, range]

Set with a % unit within the range of -1000 to 99.

[Precaution]

This parameter is validated immediately after setting (writing).
However, if it is changed during the high-accuracy modal, the operation will not be guaranteed.

5. Explanation of Read/Write Data

1-124	CURVE COMP
-------	------------

[Data definition]

This parameter sets the compensation coefficient for further reducing/enlarging the radius reduction amount at the curve during the high-accuracy control mode.

Coefficient = 100 - setting value

(Note) This is valid when "#8021 COMP CHANGE" is set to "1".

(This corresponds to the machining parameter "#8023 CURVE COMP".)

[Data unit, range]

Set with a % unit within the range of -1000 to 99.

[Precaution]

This parameter is validated immediately after setting (writing).

However, if it is changed during the high-accuracy modal, the operation will not be guaranteed.

1-140	Pre-interpolation acceleration/deceleration maximum speed
-------	---

[Data definition]

This parameter sets the cutting feedrate for the pre-interpolation acceleration/deceleration.

(This corresponds to the setup parameter, basic specification parameter "#1206 G1bF".)

[Data unit, range]

Set with a mm/min unit within the range of 1 to 999999.

[Precaution]

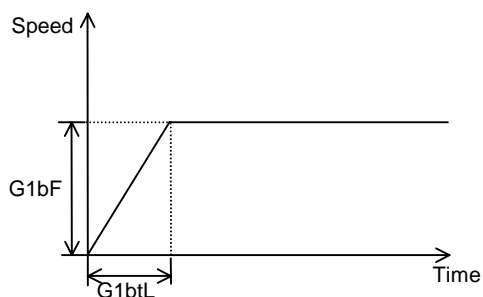
This parameter is validated immediately after setting (writing).

However, if it is changed during the high-accuracy modal, the operation will not be guaranteed.

1-141	Pre-interpolation acceleration/deceleration time constant
-------	---

[Data definition]

This parameter sets the cutting feed time constant for pre-interpolation acceleration/deceleration.



(This corresponds to the setup parameter, basic specification parameter "#1207 G1btL".)

[Data unit, range]

Set with a ms unit within the range of 1 to 5000.

[Precaution]

This parameter is validated immediately after setting (writing).

However, if it is changed during the high-accuracy modal, the operation will not be guaranteed.

5. Explanation of Read/Write Data

1-160	Feed forward filter
-------	---------------------

[Data definition]

This parameter filters acceleration changes when starting acceleration or deceleration.

Specify the parameter in bits.

(This corresponds to the setup parameter, basic specification parameter "#1131 Fldcc".)

[Data unit, range]

bit1 : 7.1 (ms)

bit2 : 14.2 (ms)

bit3 : 28.4 (ms)

bit4 : 56.8 (ms)

bit5 : 113.6 (ms)

If bit 1 to bit 5 are all "0" or two or more bits of bit 1 to bit 5 are "1", 3.5 (ms) is set up.

[Precaution]

This setting is validated when the power is turned ON and OFF after setting (writing).

1-200	Position switches [1] to [24]
-------	-------------------------------

[Data definition]

A software dog switch is established at a designated point of the axis on the machine, and the output signal from this switch is output to the PLC interface when the axis passes over this switch. A maximum of 24 switches can be set.

This switch can be used after the zero point is established.

(This corresponds to the setup parameter, position switches "#7**1 axis", "#7**2 dog1" and "#7**3 dog2".)

The position switch uses the axis, dog1 and dog2 data as one set.

axis : Name of axis for which switch is established.

dog1 : Distance 1 from basic machine coordinate system zero point

dog2 : Distance 2 from basic machine coordinate system zero point

The difference of dog1 and dog2 becomes the position switch width.

[Data unit, range]

The data unit is 1/2 of the machine constant input unit. The setting range is -99999.999 mm to +99999.999 mm.

[Precaution]

There will be a slight delay in the output signal changes in respect to the actual machine position.

This maximum delay time (tmax) can be obtained with the following equation.

$$t_{max} = 0.06 + TP [s]$$

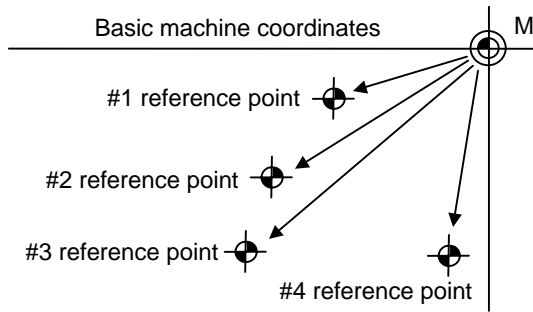
$$TP : \text{ Position loop time constant } \left(\frac{1}{PGN} [s] \right)$$

5. Explanation of Read/Write Data

2-10	Axis n	1st to 4th reference point coordinates
------	--------	--

[Data definition]

The 1st reference point, 2nd reference point, 3rd reference point and 4th reference point using 0 of the basic machine coordinates as the base point can be set for each axis with these parameters. (This corresponds to the setup parameter, reference point return parameters "#2037 G53ofs" to "#2040 #4_rfp".)



[Data unit, range]

The data unit is 1/2 of the machine constant input unit. The setting range is -99999.999 mm to +99999.999 mm.

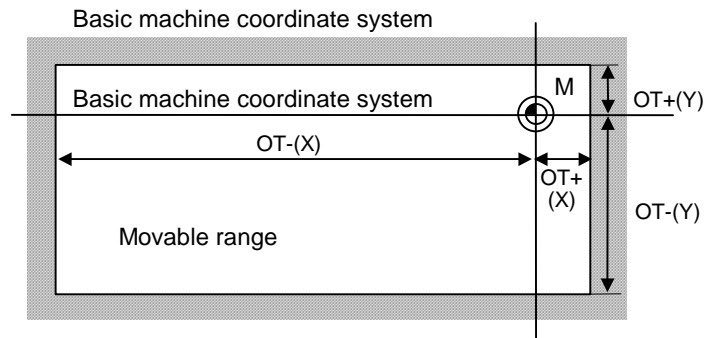
[Precaution]

This setting is validated from the next reference point return after setting (writing).

2-11	Axis n	Stored stroke limit I (+), (-) For machine maker
------	--------	--

[Data definition]

These parameters indicate the movable range in the (+) or (-) limit using 0 of the basic machine coordinates as the base point. These can be set for each axis. (This corresponds to the setup parameter, axis specification parameters "#2013 OT-" and "#2014 OT+").



[Data unit, range]

The data unit is 1/2 of the machine constant input unit. The setting range is -99999.999 mm to +99999.999 mm.

[Precaution]

This setting is validated immediately after setting (writing). (Note that this is only when the axis movement is stopped.)

5. Explanation of Read/Write Data

2-20	Axis n	Movement control parameters
------	--------	-----------------------------

[Data definition]

The following parameters are indicated in bit units.

2-20-1) Inch output

This parameter indicates whether the output unit is a metric unit or inch unit.

(This corresponds to the setup parameter, basic specification parameter "#1016 iout".)

0 : When the machine side detectors (ball screw and detectors) are metric specifications.)

1 : When the machine side detectors (ball screw and detectors) are inch specifications.)

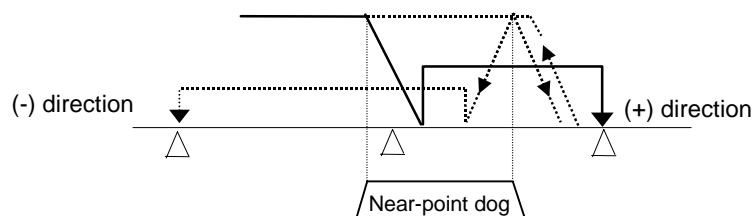
2-20-2) Reference point return direction (-)

This parameter indicates whether the reference point position is to the (-) direction or (+) direction from the reference point return near-point detection (near-point dog).

(This corresponds to the setup parameter, reference point return parameter dir(-).)

0 : (+) direction

1 : (-) direction



2-20-3) Servo OFF error compensation

The servo system will enter the servo OFF state when the servo OFF nth axis (*SVFn) signal is input from the PLC to the CNC. This parameter indicates for each axis whether the amount that the motor rotated during servo OFF is to be returned to the original state when the servo is turned ON again.

(This corresponds to the setup parameter, basic specifications parameter "#1064 svof".)

0 : Compensate the error (Do not return to the original state.)

1 : Do not compensate the error

2-20-4) Rotary axis

This parameter indicates whether the target control axis is a linear axis or rotary axis.

0 : Linear axis

1 : Rotary axis

(This corresponds to the setup parameter, basic specification parameter "#1017 rot".)

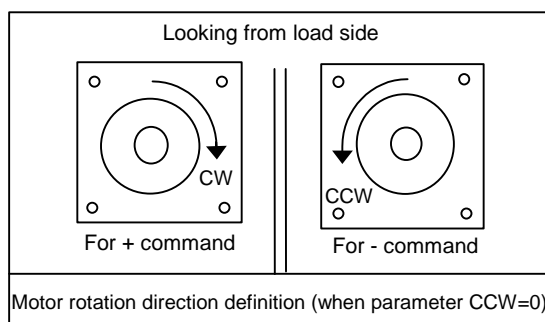
2-20-5) Motor CCW

This parameter indicates the motor rotation direction when commanded in the + direction.

0 : CW direction looking from motor load side

1 : CCW direction looking from motor load side

(This corresponds to the setup parameter, basic specification parameter "#1018 ccw".)



5. Explanation of Read/Write Data

2-20-A) No reference point axis

This parameter indicates that the control axis is one that does not have a reference point or that reference point return is not required.

0 : G28, G29, G30, manual reference point return is carried out.

1 : G28, G29, G30, manual reference point return is ignored.

(This corresponds to the setup parameter, zero point return parameter "#2031 noref".)

2-20-D) Diameter designated axis Valid only for lathe system

This parameter indicates the movement amount (commanded with U) in the X axis direction to half of the command value.

The command in address X will always be a diameter command.

0 : Addresses X and U command movement amounts are the same.

1 : The address U command movement amount is half of the address X movement amount.

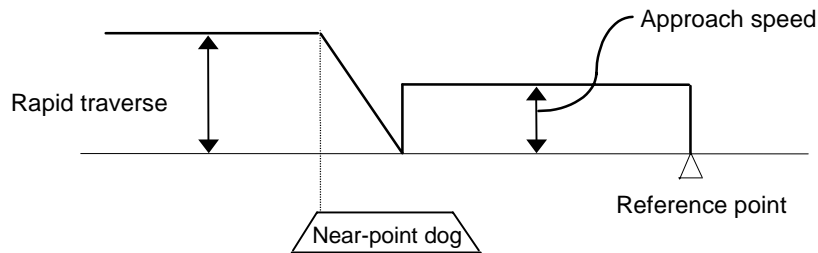
(This corresponds to the setup parameter, basic specification parameter "#1019 dia".)

2-30	Axis n	Reference point return approach speed
-------------	---------------	--

[Data definition]

This parameter indicates the movement speed when moving toward the reference point after detecting the near-point dog and decelerating to a stop during the reference point return command. This parameter can be set for each axis.

(This corresponds to the setup parameter, reference point return parameter "#2026 G28crp".)



[Data unit, range]

The data unit is mm/min, °/min or inch/min. The setting range is 1 to 999999 (binary).

[Precaution]

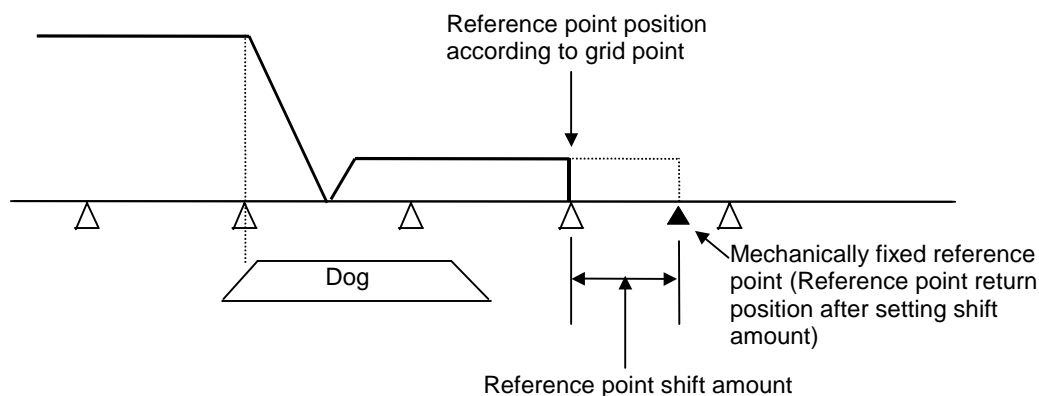
This setting is validated immediately after setting (writing).

5. Explanation of Read/Write Data

2-35	Axis n	Reference point return shift amount
------	--------	-------------------------------------

[Data definition]

This parameter defines the distance from the electrical reference point (grid) to the actual machine reference point during the reference point return command. This can be set for each axis.
(This corresponds to the setup parameter, reference point return parameter "#2027 G28sft".)



[Data unit, range]

The data unit is 1/2 of the machine constant input unit. The setting range is 1 to 65535 (μm).

[Precaution]

This setting is validated immediately after setting (writing).

2-36	Axis n	Rapid traverse backlash amount
------	--------	--------------------------------

[Data definition]

This parameter indicates the backlash amount to be compensated when the movement direction is reversed with the movement command in the rapid traverse mode or with the manual operation (excluding handle feed). This can be set for each axis.
(This corresponds to the setup parameter, axis specification parameter "#2011 G0back".)

[Data unit, range]

The data unit is 1/2 of the machine constant input unit. The setting range is -9999 to +9999 pulses.

[Precaution]

This setting is valid immediately after setting (writing).

2-37	Axis n	Cutting feed backlash amount
------	--------	------------------------------

[Data definition]

This parameter indicates the backlash amount to be compensated when the movement direction is reversed with the movement command in the cutting feed mode or with the handle feed mode of the manual operation.
(This corresponds to the setup parameter, axis specification parameter "#2012 G1back".)

[Data unit, range]

The data unit is 1/2 of the machine constant input unit. The setting range is -9999 to +9999 pulses.

[Precaution]

This setting is validated immediately after setting (writing).

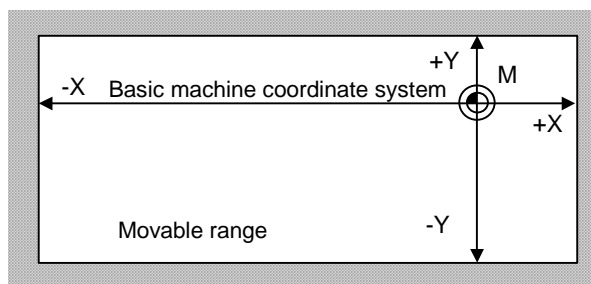
5. Explanation of Read/Write Data

2-40	Axis n	Stored stroke limit II (+), (-) For user
------	--------	--

[Data definition]

These parameters indicate the movable range in the (+) or (-) limit using 0 of the basic machine coordinates as the base point. These can be set for each axis.

(This corresponds to the user parameter, axis parameters "#8204 OT-CHECK-N" and "#8205 OT-CHECK-P".)



[Data unit, range]

The data unit is 1/2 of the machine constant input unit. The setting range is -99999.999 mm to +99999.999 mm.

[Precaution]

This setting is validated immediately after setting (writing). (Note that this is only when the axis movement is stopped.)

2-50	Axis n	Cutting feed time constant G1t
------	--------	--------------------------------

[Data definition]

Set up the primary-delay time constant for the acceleration and deceleration in the cutting feed mode. This can be set for each axis with the parameter.

(This corresponds to the setup parameter, axis specifications parameter "#2008 G1t1". When acceleration or deceleration by software is selected, the second stage time constant is used in G1t1.)

[Data unit, range]

The data unit is ms. The setting range is 1 to 5000 (ms) (binary).

[Precaution]

This setting is validated immediately after setting (writing). (Note that this is only when the axis movement is stopped.)

5. Explanation of Read/Write Data

2-51	Axis n	Current limit value 2
------	--------	-----------------------

[Data definition]

Set the rate (%) in respect to the stall rated current for special operations (absolute position initialization, stopper operation, etc.). (This is the limit value for both the + and – directions.) To make the maximum driver torque level available, assign "500". This can be set for each axis with the parameter.

(This corresponds to the setup parameter, servo parameter "#2214 SV014".)

[Data unit, range]

The data unit is the stall rated current %. The setting range is 0 to 999 (%) (binary).

[Precaution]

This setting is validated immediately after setting (writing). (Note that this is only when the axis movement is stopped.)

2-52	Axis n	Current limit value 1
------	--------	-----------------------

[Data definition]

Set the rate (%) in respect to the stall rated current for special operations (absolute position initialization, stopper operation, etc.). (This is the limit for both the + and - directions.) To use to the driver's maximum torque, set "500". This can be set for each axis with the parameters.

(This corresponds to the setup parameter, servo parameter "#2213 SV013".)

[Data unit, range]

The data unit is the stall rated current %. The setting range is 0 to 999 (%) (binary).

[Precaution]

This setting is validated immediately after setting (writing). (Note that this is only when the axis movement is stopped.)

2-60	Positive direction sensor of tool setter
------	--

[Data definition]

Set up the sensor position in the positive direction when using the tool setter.

(This corresponds to the setup parameter, axis specification parameter "#2016 tlml+").

[Data unit, range]

The data unit is 1/2 of the machine constant input unit. The setting range is –99999.999 mm to +99999.999 mm

[Precaution]

This setting is validated immediately after setting (writing).

5. Explanation of Read/Write Data

2-61	Negative direction sensor of tool setter or TLM standard length
------	---

[Data definition]

Set up the sensor position in the negative direction when using the tool setter.
When the TLM is used, set up the distance of a tool replacement point (reference point) for measuring the tool length from the zero point to the measurement reference point (surface).
(This corresponds to the setup parameter, axis specification parameter "#2015 tlmI-".)

[Data unit, range]

The data unit is 1/2 of the machine constant input unit. The setting range is -99999.999 mm to +99999.999 mm

[Precaution]

This setting is validated immediately after setting (writing).

2-62	Axis n	Feed forward gain
------	--------	-------------------

[Data definition]

This parameter sets the feed forward gain for the pre-interpolation acceleration/deceleration.
The larger the set value, the smaller the theoretical control error will be. However, if a mechanical vibration occurs, the set value must be reduced.
(This corresponds to the setup parameter, axis specification parameter "#2010 fwd_g".)

[Data unit, range]

Set with a % unit within the range of 0 to 100.

[Precaution]

This setting is validated immediately after setting (writing).

2-70	Axis n	Minimum corner deceleration speed
------	--------	-----------------------------------

[Data definition]

This parameter sets the minimum clamp speed for corner deceleration during the high-accuracy control mode.
(This corresponds to the setup parameter, axis specification parameter "#2096 crncsp".)

[Data unit, range]

Set with a mm/min unit within the range of 0 to 1000000.

[Precaution]

This setting is validated immediately after setting (writing).

5. Explanation of Read/Write Data

2-80	Rapid traverse rate
-------------	---------------------

[Data definition]

Set the rapid traverse rate for each axis.

Note that the maximum value to be set differs according to the mechanical systems.

(This corresponds to the setup parameter, axis specification parameter "#2001 rapid".)

[Data unit, range]

The data unit is mm/min, inch/min, and the setting range is 1 to 999999.

[Precaution]

This setting is validated immediately after setting (writing).

2-90	G28 rapid traverse rate
-------------	-------------------------

[Data definition]

Set the rapid traverse rate for dog type reference point return command.

Note that the maximum value to be set differs according to the mechanical systems.

(This corresponds to the setup parameter, zero point return parameter "#2025 G28rap".)

[Data unit, range]

The data unit is mm/min, inch/min, and the setting range is 1 to 999999.

[Precaution]

This setting is validated immediately after setting (writing).

5. Explanation of Read/Write Data

3-10	Compensation basic axis number
-------------	---------------------------------------

[Data definition]

Specify the basic axis address for machine error compensation.
For pitch error compensation, set the name of the axis to be compensated.
For relative position compensation, set the name of the axis to be the base axis.
(This corresponds to the setup parameter, machine compensation parameter "#4001 cmpax".)

[Data unit, range]

Set the axis address of X, Y, Z, U, V, W, A, B, or C etc.

[Precaution]

This setting is validated immediately after setting (writing). (Note that this is only when the axis movement is stopped.)

3-11	Compensation direction axis number
-------------	---

[Data definition]

Specify the compensation axis address for machine error compensation.
For pitch error compensation, set the same axis name as #4001 cmpax.
For relative position compensation, set the name of the axis to be actually compensated.
(This corresponds to the setup parameter, machine compensation parameter "#4002 drcax".)

[Data unit, range]

Set the axis address of X, Y, Z, U, V, W, A, B, or C etc.

[Precaution]

This setting is validated immediately after setting (writing). (Note that this is only when the axis movement is stopped.)

3-12	Division point number at reference position
-------------	--

[Data definition]

Set the compensation data No. corresponding to the reference point position. The reference point is actually the base, so there is no compensation No. Set the number that is decremented by 1.
(This corresponds to the setup parameter, machine compensation parameter "#4003 rdvno".)

[Data unit, range]

The setting range is 4101 to 5124 (binary).

[Precaution]

This setting is validated immediately after setting (writing). (Note that this is only when the axis movement is stopped.)

5. Explanation of Read/Write Data

3-13	Division point number at the most negative side
-------------	--

[Data definition]

Set the compensation data No. that is on the farthest negative side.
(This corresponds to the setup parameter, machine compensation parameter "#4004 mdvno".)

[Data unit, range]

The setting range is 4101 to 5124 (binary).

[Precaution]

This setting is validated immediately after setting (writing). (Note that this is only when the axis movement is stopped.)

3-14	Division point number at the most positive side
-------------	--

[Data definition]

Set the compensation data No. that is on the farthest positive side.
(This corresponds to the setup parameter, machine compensation parameter "#4005 pdvno".)

[Data unit, range]

The setting range is 4101 to 5124 (binary).

[Precaution]

This setting is validated immediately after setting (writing). (Note that this is only when the axis movement is stopped.)

3-15	Compensation scale factor
-------------	----------------------------------

[Data definition]

Set the compensation amount's scale.
(This corresponds to the setup parameter, machine compensation parameter "#4006 sc".)

[Data unit, range]

The setting range is 0 to 99 (binary).

[Precaution]

This setting is validated immediately after setting (writing). (Note that this is only when the axis movement is stopped.)

3-16	Division interval
-------------	--------------------------

[Data definition]

Set the interval to divide the basic axis. Each compensation data will be the compensation amount for each of these intervals.
(This corresponds to the setup parameter, machine compensation parameter "#4007 spcdv".)

[Data unit, range]

The setting range is 1 to 9999999 (binary).

[Precaution]

This setting is validated immediately after setting (writing). (Note that this is only when the axis movement is stopped.)

5. Explanation of Read/Write Data

4-10	Axis n G54 Workpiece coordinate system offset
4-11	Axis n G55 Workpiece coordinate system offset
4-12	Axis n G56 Workpiece coordinate system offset
4-13	Axis n G57 Workpiece coordinate system offset
4-14	Axis n G58 Workpiece coordinate system offset
4-15	Axis n G59 Workpiece coordinate system offset

[Data definition]

These are the G54 to G59 workpiece offset amount of the nth axis (n: 1 to No. of control axes.)
(This corresponds to the tool/compensation amount workpiece coordinate offset G54 to G59.)

[Data unit, range]

Unit:

Input unit system (iunit)	Linear axis		Rotary axis
	Input unit (metric)	Input unit (inch)	
B	0.0005 mm	0.00005 inch	0.0005 °
C	0.00005 mm	0.000005 inch	0.00005 °

Range: (-99999999 to +99999999) × 2 (binary)

[Precautions]

- (1) This setting is valid after the data is rewritten and the next workpiece coordinate changeover is commanded.

4-16	Axis n External workpiece coordinate system offset
------	--

[Data definition]

This is the external workpiece coordinate system offset amount of the nth axis (n : 1 to No. of control axes).
(This corresponds to the tool/compensation amount workpiece coordinate offset EXT.)

[Data unit, range]

Unit:

Input unit system (iunit)	Linear axis		Rotary axis
	Input unit (metric)	Input unit (inch)	
B	0.0005 mm	0.00005 inch	0.0005 °
C	0.00005 mm	0.000005 inch	0.00005 °

Range: (-99999999 to +99999999) × 2 (binary)

[Precautions]

- (1) This setting is valid after the data is rewritten and the next workpiece coordinate changeover is commanded.

5. Explanation of Read/Write Data

4-17	Axis n Extended workpiece coordinate system offset [1 to 48]
-------------	---

[Data definition]

This is the G54.1 P1 to 48 workpiece offset amount of the nth axis (n : 1 to No. of control axes).
 (This corresponds to the tool/compensation amount workpiece coordinate offset G54.1 P1 to 48.)

[Data unit, range]

Unit:

Input unit system (iunit)	Linear axis		Rotary axis
	Input unit (metric)	Input unit (inch)	
B	0.0005 mm	0.00005 inch	0.0005 °
C	0.00005 mm	0.000005 inch	0.00005 °

Range: -199999998 to +199999998

[Precautions]

- (1) This setting is valid after the data is rewritten and the next workpiece coordinate changeover is commanded.

5-30	Servo alarm No.
-------------	------------------------

[Data definition]

This indicates that an error has occurred in the servo system.
 When an error occurs, the NC alarm 2 (AL2: X211) will turn ON.

(1) Data configuration

Sub-section No.	Details	
16	Alarm No. main (2-byte)	
18	Alarm attribute (2-byte) bit F	(hexadecimal)
	0: No alarm	
	1: Alarm has occurred	
20	Alarm No. sub 1 (2-byte)	
22	Alarm No. sub 2 (2-byte)	

5. Explanation of Read/Write Data

(2) Alarm contents

Alarm No. Main	Alarm No. Sub 1	Alarm No. Sub 2	Alarm contents
1	10	Axis No. is set	Insufficient voltage
1	11		Axis selection error
1	12		Memory error 1
1	13		Software processing error 1
1	14		Software processing error 2
1	15		Memory error 2
1	16		Magnetic pole position detection error
1	17		A/D converter error
1	18		Motor side detector: Initial communication error
1	19		Detector communication error in synchronous control
1	1A		Machine side detector: Initial communication error
1	1B		Machine side detector: CPU error 1
1	1C		Machine side detector: EEPROM/LED error
1	1D		Machine side detector: Data error
1	1E		Machine side detector: Memory error
1	1F		Machine side detector: Communication error
1	20		Motor side detector: No signal
1	21		Machine side detector: No signal
1	22		LSI error
1	23		Excessive speed error 1
1	24		Grounding
1	25		Absolute position data lost
1	26		Unused axis error
1	27		Machine side detector: CPU error 2
1	28		Machine side detector: Overspeed
1	29		Machine side detector: Absolute position data error

(Continued on next page)

5. Explanation of Read/Write Data

Alarm No. Main	Alarm No. Sub 1	Alarm No. Sub 2	Alarm contents
1	2A	Axis No. is set	Machine side detector: Relative position data error
1	2B		Motor side detector: CPU error 1
1	2C		Motor side detector: EEPROM/LED error
1	2D		Motor side detector: Data error
1	2E		Motor side detector: Memory error
1	2F		Motor side detector: Communication error
1	30		Over regeneration
1	31		Overspeed
1	32		Power module overcurrent
1	33		Overvoltage
1	34		NC-DRV communication: CRC error
1	35		NC command error
1	36		NC-DRV communication: Communication error
1	37		Initial parameter error
1	38		NC-DRV communication: Protocol Error 1
1	39		NC-DRV communication: Protocol Error 2
1	3A		Overcurrent
1	3B		Power module overheat
1	3C		Regeneration circuit error
1	3D		Spindle speed blocked
1	3E		Spindle speed overrun
1	3F		Excessive speed error 2
1	40		Detector selection unit switching error
1	41		Detector selection unit communication error
1	42		Feedback error 1
1	43		Feedback error 2
1	44		Inappropriate coil selected for C axis
1	45		Fan stop
1	46		Motor overheat
1	47		Regenerative resistor overheat
1	48		Motor side detector: CPU error 2
1	49		Motor side detector: Overspeed
1	4A		Motor side detector: Absolute position data error
1	4B		Motor side detector: Relative position data error
1	4C		Current error at magnetic pole detection
1	4E		NC command mode error
1	4F		Instantaneous power interruption

(Continued on next page)

5. Explanation of Read/Write Data

Alarm No. Main	Alarm No. Sub 1	Alarm No. Sub 2	Alarm contents
1	50	Axis No. is set	Overload 1
1	51		Overload 2
1	52		Excessive error 1
1	53		Excessive error 2
1	54		Excessive error 3
1	55		External emergency stop error
1	57		Option error
1	58		Collision detection 1: G0
1	59		Collision detection 1: G1
1	5A		Collision detection 2
1	5C		Orientation feedback error
1	5D		Speed monitoring: Input mismatch
2	5E		Speed monitoring: Feedback speed error
1	5F		External contactor welding
1	61		Power module overcurrent
1	62		Frequency error
1	63		Supplementary regeneration error
1	65		Rush relay error
1	67		Phase interruption
1	68		Watchdog
1	69		Grounding
1	6A		External contactor welding
1	6B		Rush relay welding
1	6C		Main circuit error
1	6D		Parameter error
1	6E		Memory error
1	6F		Power supply error
1	71		Instantaneous power interruption
1	73		Over regeneration
1	74		Regenerative resistor overheat
1	75		Overvoltage
1	76		External emergency stop setting error
1	77		Power module overheat
1	7F		Drive unit power supply restart request

(Continued on next page)

5. Explanation of Read/Write Data

Alarm No. Main	Alarm No. Sub 1	Alarm No. Sub 2	Alarm contents
1	80	Axis No. is set	Detector converting unit 1: Connection error
1	81		Detector converting unit 1: Communication error
1	83		Detector converting unit 1: Judgment error
1	84		Detector converting unit 1: CPU error
1	85		Detector converting unit 1: Data error
1	86		Detector converting unit 1: Magnetic pole error
1	88		Watchdog
1	89		Detector converting unit 2: Connection error
1	8A		Detector converting unit 2: Communication error
1	8B		Detector converting unit 2: Automatic tuning error
1	8C		Detector converting unit 2: Judgment error
1	8D		Detector converting unit 2: CPU error
1	8E		Detector converting unit 2: Data error

(Note 1) Depending on the driver type and power supply type, there may be some alarms that might not occur.

(Note 2) Refer to the alarm No. when the alarm attribute bit F is set to 1.

(Note 3) All the alarms, including the ones related to the functions that cannot be used, are listed in this manual. Check the specification before using the data.

5. Explanation of Read/Write Data

5-90	Servo warning No.
------	-------------------

[Data definition]

This indicates that a warning alarm has occurred in the servo system.

(1) Data configuration

Sub-section No.	Details	
64	Alarm No. main (2-byte)	
66	Alarm attribute (2-byte) bit F	(hexadecimal)
	0: No alarm	
	1: Alarm has occurred	
68	Alarm No. sub 1 (2-byte)	
70	Alarm No. sub 2 (2-byte)	

(2) Alarm contents

Alarm No. Main	Alarm No. Sub 1	Alarm No. Sub 2	Alarm contents
2	90	Axis No. is set.	Detector : Initial communication error
2	91		Detector : Communication error
2	92		Detector : Protocol error
2	93		Initial absolute position fluctuation
2	96		Scale feedback error
2	97		Scale offset error
2	9B		Detector converting unit: Magnetic pole shift warning
2	9C		Detector converting unit: Magnetic pole warning
2	9E		Absolute position detector : Revolution counter error
2	9F		Battery voltage drop
2	A6		Fan stop warning
2	A8		Turret indexing warning
2	A9		Orientation feedback warning
2	E0		Over regeneration warning
2	E1		Overload warning
2	E2		Continuous high-speed revolution warning
2	E3		Absolute position counter warning
2	E4		Set parameter warning
2	E6		Control axis detachment warning
2	E7		In NC emergency stop state
2	E8		Excessive supplementary regeneration frequency
2	E9		Instantaneous power interruption warning
2	EA		In external emergency stop state
2	EB		Over regeneration warning

(Note 1) E7 of the alarm No. sub 1 cannot be viewed as the servo warning No.

(Note 2) Refer to the alarm No. when the alarm attribute bit F is set to 1.

(Note 3) All the alarms, including the ones related to the functions that cannot be used, are listed in this manual. Check the specification before using the data.

5. Explanation of Read/Write Data

5-130	Operation error No.
--------------	----------------------------

[Data definition]

This indicates that the axis cannot move, etc., due to the operation or machine side conditions. When an error occurs, the NC alarm 4 (AL4: X213) will turn ON.

(1) Data configuration

Sub-section No.	Details	
96	Alarm No. main (2-byte)	
98	Alarm attribute (2-byte) bit F	0: No alarm 1: Alarm has occurred
100	Alarm No. sub 1 (2-byte)	(hexadecimal)
102	Alarm No. sub 2 (2-byte)	

(2) Alarm contents

Alarm No. Main	Alarm No. Sub 1	Alarm No. Sub 2	Alarm contents
1	1	Alarm axis No.	Dog overrun
1	2	Alarm axis No.	Z-axis not cross
1	3	Alarm axis No.	Invalid return
1	4	Alarm axis No.	External interlock
1	5	Alarm axis No.	Internal interlock
1	6	Alarm axis No.	H/W stroke end
1	7	Alarm axis No.	S/W stroke end
1	8	—	Chuck/tail-stock barrier stroke end axis found
1	9	—	Reference point return number illegal
1	19	—	Sensor signal illegal No.
1	20	—	Reference point return illegal
1	24	—	Reference point return disabled during absolute position detection alarm
1	25	—	Reference point return disabled during zero point initialization
1	50	—	Chopping axis reference point return incomplete
1	51	—	Synchronization error too large
1	101	—	Not operation mode
1	102	—	Override zero
1	103	—	External feedrate zero
1	104	—	F1-digit speed zero
1	105	—	Spindle stop
1	106	—	Handle feed axis No. illegal
1	107	—	Spindle speed excessive
1	108	—	Fixed point mode feed axis No. illegal
1	109	—	Block start interlock
1	110	—	Cutting block start interlock

(Continued on next page)

5. Explanation of Read/Write Data

Alarm No. Main	Alarm No. Sub 1	Alarm No. Sub 2	Alarm contents
1	111	—	Restart switch ON
1	112	—	Program check mode
1	113	—	Automatic start during buffer correction
1	115	—	Resetting
1	117	—	Play back not possible
1	118	—	Block seams turning stop during normal line control
1	120	—	Synchronization correction mode ON
1	121	—	No synchronous control option
1	123	—	Computer link B
1	124	Alarm axis No.	Simultaneous axes movement prohibition when the incline axis control is valid
1	126	Alarm axis No.	Program restart machine lock
1	150	—	Chopping override zero
1	151	Alarm axis No.	Chopping axis conflict
1	153	—	Chopping stroke zero
1	154	Alarm axis No.	Chopping axis handle selection axis
1	160	Alarm axis No.	Axis with no maximum speed set for the outside of the soft limit range
1	1005	—	Execution of G114.* during G114.*
1	1007	—	Spindle busy in synchronous tap
1	1026	—	Spindle C axis and other position controls commanded simultaneously
1	1030	—	Synchronization mismatch
1	1031	—	C axis selection signal changed when several C axis selection is impossible
1	1032	—	Tap return spindle selection illegal in multi-spindle
1	1033	—	Cutting feed waited until synchronization complete
1	1034	—	Cross machining command illegal
1	1035	—	Cross machining control impossible modal
1	1036	—	Synchronous control designation impossible
1	1037	—	Synchronous control start/ synchronous control start in the state that cancellation is impossible/cancellation command
1	1038	—	Movement command to synchronous axis during synchronous control
1	1106	—	Spindle synchronization phase calculation illegal

(Note 1) Refer to the alarm No. when the alarm attribute bit F is set to 1.

(Note 2) All the alarms, including the ones related to the functions that cannot be used, are listed in this manual. Check the specification before using the data.

5. Explanation of Read/Write Data

(2) Alarm contents

Alarm No. Main	Alarm No. Sub 1	Alarm No. Sub 2	Alarm contents
1	101	—	Axis in motion
1	102	—	Ready off
1	103	—	Reset on
1	104	—	Automatic operation stop signal "ON"
1	105	—	H/W stroke end axis
1	106	—	S/W stroke end axis
1	107	—	No operation mode
1	108	—	Operation mode duplicated
1	109	—	Operation mode shift
1	110	—	Tape search execution
1	111	—	Program restart search execution
1	112	—	Program restart position not returned
1	113	—	Thermal alarm
1	115	—	Communicating with host
1	138	—	Disabled start during absolute position detection alarm
1	139	—	Disabled start during zero point initialization
1	190	—	Automatic start disabled
1	191	—	Automatic start disabled
2	201	—	H/W stroke end axis
2	202	—	S/W stroke end axis
2	203	—	Reset signal on
2	204	—	Automatic operation stop
2	205	—	Automatic mode change
2	206	—	Acceleration and deceleration time constant too large
2	215	—	Absolute position detection alarm stop
3	301	—	Single block on
3	302	—	User macro stop
3	303	—	Mode change
3	304	—	MDI completion
3	305	—	Block start interlock
3	306	—	Cutting block start interlock
3	310	—	Offset change of inclined Z-axis during program operation
4	401	—	Verify stop
10	(Note 3)	—	The error number is displayed while each of the completion wait modes listed in the table below is on. It disappears when the mode is canceled.

5. Explanation of Read/Write Data

(Note 1) Refer to the alarm No. when the alarm attribute bit F is set to 1.

(Note 2) All the alarms, including the ones related to the functions that cannot be used, are listed in this manual. Check the specification before using the data.

(Note 3) 0

Alarm No.	Waiting for unclamp signal (*2)	Dwelling
0		
1		×
8	×	
9	×	×

Alarm No.	Door open (*1)	Waiting for spindle position to be looped	Alarm No.	Waiting for spindle orientation to complete	Waiting for cutting speed deceleration	Waiting for rapid traverse deceleration	Waiting for MSTB completion
0			0				
1		×	1				×
8	×		2			×	
9	×	×	3			×	×
			4		×		
			5		×		×
			6		×	×	
			7		×	×	×
			8	×			
			9	×			×
			A	×		×	
			B	×		×	×
			C	×	×		
			D	×	×		×
			E	×	×	×	
			F	×	×	×	×

(*1) This mode is enabled by the door interlock function.

(*2) The system is waiting for the index table indexing unclamp signal to turn ON or OFF.

5. Explanation of Read/Write Data

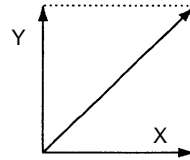
11/15-10	Interpolation vector length
----------	------------------------------------

[Data definition]

The remaining movement distance of the block being executed is indicated.

$$\sqrt{\sum (\text{Remaining movement distance of each axis})^2}$$

[Interpolation vector length]



[Data unit]

Input unit system (iunit)	Linear axis		Rotary axis
	Input unit (metric)	Input unit (inch)	
B	0.0005 mm	0.00005 inch	0.0005 °
C	0.00005 mm	0.000005 inch	0.00005 °

[Precaution]

The data is not set when G0 non-interpolation (G0Intp = 1). The data will be updated with the interpolation cycle.

11/15-20	Movement mode
----------	----------------------

[Data definition]

Data (binary)	Contents
0	G00 Positioning (each axis independent)
1	G00 Positioning (linear)
2	G01 Linear interpolation
3	G02 Circular interpolation (CW)
4	G03 Circular interpolation (CCW)
5	G02 X__Y__Z__ Helical interpolation (CW)
6	G03 X__Y__Z__ Helical interpolation (CCW)
7	
8	
9	
10	
11	G04 Time designated dwell
12	
13	G27_P1 1st reference position verification
14	G27_P2 2nd reference position verification
15	G27_P3 3rd reference position verification
16	G27_P4 4th reference position verification
17	G28 Automatic reference position return
18	G29 Return from automatic reference position
19	G30_P2 2nd reference position return
20	G30_P3 3rd reference position return
21	G30_P4 4th reference position return
22	G31 Skip function
23	G31.1 Multi-step skip function 1
24	G31.2 Multi-step skip function 2
25	G31.3 Multi-step skip function 3
26	G33 Thread cutting (G32 for lathe G code series 2.)
27	G34 Variable lead thread cutting (only lathe)
28	
29	G92 Coordinate system setting
30	

5. Explanation of Read/Write Data

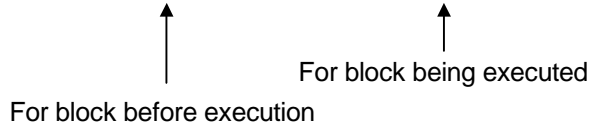
12/16-10	Axis direction movement amount
----------	--------------------------------

[Data definition]

The remaining movement distance of each axis in the block being executed is indicated.

(Machine position at movement end point)

- (Machine position at movement start point or current position)



[Data unit]

Input unit system (iunit)	Linear axis		Rotary axis
	Input unit (metric)	Input unit (inch)	
B	0.0005 mm	0.00005 inch	0.0005 °
C	0.00005 mm	0.000005 inch	0.00005 °

[Precautions]

- (1) If the movement mode is skip or multi-step skip, the movement end point will not be the skip stop point, but instead will be a value calculated from the commanded value.
- (2) If the movement mode is counter preset, the counter preset value will be set instead of the remaining movement distance of each axis. The value will be cleared immediately after the counter preset is executed.
- (3) If the movement mode is reference point return, the remaining movement distance to the middle point will be set.
- (4) If the movement mode is start position return, the remaining movement distance from the middle point will be set.

5. Explanation of Read/Write Data

13/17-10	Interpolation mode (G code group 1)
-----------------	--

[Data definition]

The current movement modal (group 1) is indicated.

Data	Machining center system	Lathe system			
		Series 2	Series 3	Series 6	Series 7
0	G00	G00	G00	G00	G00
1	G01	G01	G01	G01	G01
2	G02	G02	G02	G02	G02
3	G03	G03	G03	G03	G03
4	—	—	—	—	—
5	—	—	—	—	—
6	G33	G32	G33	G32	G33
7	—	—	—	—	—
8	—	G34	G34	G34	G34

13/17-11	Plane selection (G code group 2)
-----------------	---

[Data definition]

The current plane selection modal (group 2) is indicated.

Data	Machining center system	Lathe system			
		Series 2	Series 3	Series 6	Series 7
0	G17	G17	G17	G17	G17
1	G18	G18	G18	G18	G18
2	G19	G19	G19	G19	G19

13/17-12	Feed mode (G code group 5)
-----------------	-----------------------------------

[Data definition]

The current feed modal (group 5) is indicated.

Data	Machining center system	Lathe system			
		Series 2	Series 3	Series 6	Series 7
0	—	—	—	—	—
1	G94	G98	G94	G98	G94
2	G95	G99	G95	G99	G95

5. Explanation of Read/Write Data

13/17-13	Radius compensation modal (G code group 7)
-----------------	---

[Data definition]

The current radius compensation modal (group 7) is indicated.

Data	Machining center system	Lathe system			
		Series 2	Series 3	Series 6	Series 7
0	G40	G40	G40	G40	G40
1	G41	G41	G41	G41	G41
2	G42	G42	G42	G42	G42
3	—	G46	G46	G46	G46

13/17-14	Fixed cycle modal (G code group 9)
-----------------	---

[Data definition]

The current fixed cycle modal (group 9) is indicated.

Data	Machining center system	Lathe system			
		Series 2	Series 3	Series 6	Series 7
0	—	G72	G72	G72	G72
1	—	G73	G73	G73	G73
2	—	G74	G74	G74	G74
3	—	G75	G75	G75	G75
4	—	G76	G76	G76	G76
5	—	G90	G77	G90	G77
6	—	G92	G78	G92	G78
7	—	G94	G79	G94	G79
8	G80	G80	G80	G80	G80
9	G81	—	—	—	—
10	G82	—	—	—	—
11	G83	G83	G83	G83	G83
12	G84	G84	G84	G84	G84
13	G85	G85	G85	G85	G85
14	G86	—	—	—	—
15	G87	G87	G87	G87	G87
16	G88	G88	G88	G88	G88
17	G89	G89	G89	G89	G89
18	—	—	—	—	—
19	—	G70	G70	G70	G70
20	—	G71	G71	G71	G71
21	G73	—	—	—	—
22	G74	—	—	—	—
23	G76	G79	G83.2	G79	G83.2

5. Explanation of Read/Write Data

13/17-15	Workpiece coordinate system modal (G code group 12)
-----------------	--

[Data definition]

The current workpiece coordinate system modal (group 12) is indicated.

Data	Machining center system	Lathe system			
		Series 2	Series 3	Series 6	Series 7
0	G54	G54	G54	G54	G54
1	G55	G55	G55	G55	G55
2	G56	G56	G56	G56	G56
3	G57	G57	G57	G57	G57
4	G58	G58	G58	G58	G58
5	G59	G59	G59	G59	G59

13/17-16	Cutting mode (G code group 13)
-----------------	---------------------------------------

[Data definition]

The current cutting modal (group 13) is indicated.

Data	Machining center system	Lathe system			
		Series 2	Series 3	Series 6	Series 7
0	G61	G61	G61	G61	G61
1	G62	G62	G62	G62	G62
2	G63	G63	G63	G63	G63
3	G64	G64	G64	G64	G64

13/17-17	Other G modals (G code group 3, 4, 6, 10, 17, 18)
-----------------	--

[Data definition]

The current G modal (group 3, 4, 6, 10, 17, 18) is indicated.

	bit7	bit6	bit5	bit4	bit3	bit2	*bit1	bit0
			Group 17		Group 10	Group 6	Group 4	Group 3
1			G96		G99	G20	G22	G90
0			G97		G98	G21	G23	G91

* Lathe system

13/17-20	Block No.
-----------------	------------------

[Data definition]

The current block No. is indicated.

[Data range]

The setting range is 0 to 99.

5. Explanation of Read/Write Data

13/17-40	Miscellaneous function (M) code (BCD)
----------	--

[Data definition]

The miscellaneous function No. commanded with the miscellaneous function code (M) is indicated.

13/17-41	Spindle function (S) code (BIN)
----------	--

[Data definition]

The spindle speed commanded with the spindle function code (S) is indicated.

13/17-42	Tool function (T) code (BCD)
----------	-------------------------------------

[Data definition]

The tool No. commanded with the tool function code (T) is indicated.

13/17-43	2nd miscellaneous function (B) code (BCD)
----------	--

[Data definition]

The data commanded with the 2nd miscellaneous function code (B, A or C) is indicated.

13/17-44	Program No.
----------	--------------------

[Data definition]

The current program No. (modal) is indicated.

[Data range]

The setting range is 1 to 99999999 (binary).

13/17-45	Sequence No.
----------	---------------------

[Data definition]

The current sequence No. is indicated.

[Data range]

The setting range is 1 to 99999 (binary).

13/17-50	Tool radius compensation amount and nose R compensation amount
----------	---

[Data definition]

The current tool radius compensation amount (nose R compensation amount) is indicated.
The plane selection 1st axis, 2nd axis and 3rd axis apply in the order that parameters #1026 Base_I, #1027 Base_J and #1028 Base_K are set.

[Data unit]

The unit is one half of the machine constant input unit.

5. Explanation of Read/Write Data

14/18-10	Tool length compensation No.
-----------------	-------------------------------------

[Data definition]

The tool length compensation No. of that axis is indicated.

[Data range]

The setting range is 0 to the maximum compensation No. (binary).
This is valid only for the machining center system.

14/18-20	Axis n Workpiece offset amount
-----------------	---------------------------------------

[Data definition]

The currently applied work offset amount is indicated.

[Data unit]

The unit is one half of the machine constant input unit.

14/18-21	Axis n Tool length compensation amount (M)
-----------------	---

[Data definition]

The currently applied tool length compensation amount is indicated.

[Data unit]

The unit is one half of the machine constant input unit.

14/18-22	Axis n Tool shape offset amount (L)
-----------------	--

[Data definition]

The currently applied tool shape compensation amount is indicated.

[Data unit]

The unit is one half of the machine constant input unit.

14/18-23	Axis n Tool length compensation amount (L)
-----------------	---

[Data definition]

The currently applied tool length compensation amount is indicated.

[Data unit]

The unit is one half of the machine constant input unit.

14/18-24	Axis n Tool wear compensation amount (L)
-----------------	---

[Data definition]

The current tool wear compensation amount is indicated.

[Data unit]

The unit is one half of the machine constant input unit.

5. Explanation of Read/Write Data

20-10	Automatic effective feedrate
--------------	-------------------------------------

[Data definition]

The actual feedrate in the automatic mode is indicated.

(This includes the speed change conditions such as override.)

(1) For G0, G1, G2, G3, G27

The composite speed of all commanded axes is indicated.

(2) For G28, G29, G30

The speed of the fastest axis among the axes moving simultaneously is indicated.

[Data unit]

Input unit system (iunit)	Input unit (metric)	Input unit (inch)
B	1×2^{-10} mm/min	0.1×2^{-10} inch/min
C	0.1×2^{-10} mm/min	0.01×2^{-10} inch/min

20-11	Manual effective feedrate
--------------	----------------------------------

[Data definition]

The actual feedrate in the manual mode is indicated.

(This includes the speed change conditions such as override.)

The speed of the fastest axis among the axes moving simultaneously is indicated.

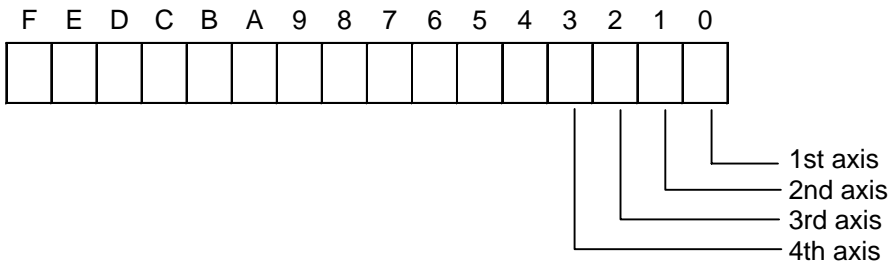
[Data unit]

Input unit system (iunit)	Input unit (metric)	Input unit (inch)
B	1×2^{-10} mm/min	0.1×2^{-10} inch/min
C	0.1×2^{-10} mm/min	0.01×2^{-10} inch/min

20-20	In-position
--------------	--------------------

[Data definition]

This indicates that the control axes are in the state of in-position



5. Explanation of Read/Write Data

21-10	Current position in machine coordinate system
--------------	--

[Data definition]

The current position of the axis in the machine coordinate system is indicated.

[Data unit]

Input unit system (iunit)	Linear axis		Rotary axis
	Input unit (metric)	Input unit (inch)	
B	0.0005 mm	0.00005 inch	0.0005 °
C	0.00005 mm	0.000005 inch	0.00005 °

21-12	Manual interrupt amount (1) (Manual absolute switch OFF)
--------------	---

[Data definition]

The total of the movement amount in the manual mode with the manual absolute switch OFF is indicated.

The program coordinate system is shifted by the distance corresponding to this data.

[Data unit]

Input unit system (iunit)	Linear axis		Rotary axis
	Input unit (metric)	Input unit (inch)	
B	0.0005 mm	0.00005 inch	0.0005 °
C	0.00005 mm	0.000005 inch	0.00005 °

21-13	Manual interrupt amount (2) (Manual absolute switch ON)
--------------	--

[Data definition]

The total of the movement amount in the manual mode with the manual absolute switch ON is indicated.

This data is cleared in the following cases:

- (1) When calculation of the buffer is started during automatic starting, or when automatic start up is executed.
- (2) When the reset signal is input.

[Data unit]

Input unit system (iunit)	Linear axis		Rotary axis
	Input unit (metric)	Input unit (inch)	
B	0.0005 mm	0.00005 inch	0.0005 °
C	0.00005 mm	0.000005 inch	0.00005 °

5. Explanation of Read/Write Data

21-20	Current position in workpiece coordinate system
--------------	--

[Data definition]

The current position in the currently selected workpiece coordinate system is indicated.

[Data unit]

Input unit system (iunit)	Linear axis		Rotary axis
	Input unit (metric)	Input unit (inch)	
B	0.0005 mm	0.00005 inch	0.0005 °
C	0.00005 mm	0.000005 inch	0.00005 °

21-30	Current position in workpiece coordinate system during skip ON
--------------	---

[Data definition]

The current position in the workpiece coordinate system when the skip signal is input during the G31 command is indicated.

This corresponds to the macro variables #5061, #5062

[Data unit]

Input unit system (iunit)	Linear axis		Rotary axis
	Input unit (metric)	Input unit (inch)	
B	0.0005 mm	0.00005 inch	0.0005 °
C	0.00005 mm	0.000005 inch	0.00005 °

21-31	Current position in machine coordinate system during skip ON
--------------	---

[Data definition]

The current position in the machine coordinate system when the skip signal is input during the G31 command is indicated.

[Data unit]

Input unit system (iunit)	Linear axis		Rotary axis
	Input unit (metric)	Input unit (inch)	
B	0.0005 mm	0.00005 inch	0.0005 °
C	0.00005 mm	0.000005 inch	0.00005 °

5. Explanation of Read/Write Data

21-32	Remaining distance during skip ON
--------------	--

[Data definition]

The remaining commanded distance when the skip signal is input during the G31 command is indicated.

[Data unit]

Input unit system (iunit)	Linear axis		Rotary axis
	Input unit (metric)	Input unit (inch)	
B	0.0005 mm	0.00005 inch	0.0005 °
C	0.00005 mm	0.000005 inch	0.00005 °

21-34	Command position in machine coordinate system
--------------	--

[Data definition]

Command position in the machine coordinate system to be output to the drive unit is indicated.

[Data unit, range]

Input unit system (iunit)	Linear axis		Rotary axis
	Input unit (metric)	Input unit (inch)	
B	0.0005 mm	0.00005 inch	0.0005 °
C	0.00005 mm	0.000005 inch	0.00005 °

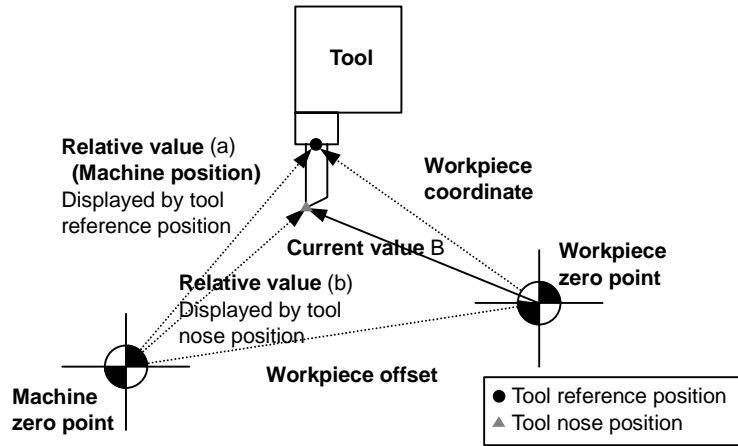
5. Explanation of Read/Write Data

21-40	Axis n	Relative coordinate value
-------	--------	---------------------------

[Data definition]

The coordinate position using the machine zero point as a reference is indicated.

Whether the tool reference position (figure below (a)) or the current position of the tool nose position (figure below (b)) that considers offset, such as tool length offset amount and tool diameter compensation amount in the tool reference position is applied to data details can be selected with the parameter.



(The relation of the data details and parameters is shown below.)

#1221 aux05/bit7	0	Relative value The compensation amount is considered according to #1287 ext23/bit4,5 contents.
	1	Current value B

[Data unit]

Input unit system (iunit)	Linear axis		Rotary axis
	Input unit (metric)	Input unit (inch)	
B	0.0005 mm	0.00005 inch	0.0005 °
C	0.00005 mm	0.000005 inch	0.00005 °

5. Explanation of Read/Write Data

21-41	Axis n	Current value B
--------------	---------------	------------------------

[Data definition]

Tool nose position coordinate that is considered tool length offset and tool diameter compensation can be displayed in workpiece coordinate. Tool length offset and tool diameter compensation that are considered depend on tool (T) designation or the currently selected tool No. that is input from the external source.

[Data unit]

Input unit system (iunit)	Linear axis		Rotary axis
	Input unit (metric)	Input unit (inch)	
B	0.0005 mm	0.00005 inch	0.0005 °
C	0.00005 mm	0.000005 inch	0.00005 °

21-42	Axis n	Axis name
--------------	---------------	------------------

[Data definition]

Axis name address for each axis.

[Data unit]

This is a hexadecimal ASCII data. Example: "A" is read as 41, and "X" is read as 58.

21-43	Axis n	Increment command axis name
--------------	---------------	------------------------------------

[Data definition]

This is the incremental command axis name address for designating absolute or incremental for the program movement amount.

[Data unit]

This is a hexadecimal ASCII data. Example: "U" is read as 55.

21-44	Axis n	2nd axis name
--------------	---------------	----------------------

[Data definition]

This is the 2-character axis name displayed on the screen.

[Data unit]

This is a hexadecimal ASCII data. Example: "X1" is read as 5831, "C2" is read as 4332 and "Z" is read as 205A.

5. Explanation of Read/Write Data

22-10	Emergency stop causes
-------	-----------------------

[Data definition]

The cause of why the CNC entered the emergency stop state is indicated.

This data can also be referred to with the file register R69 in the PLC and CNC interfaces.

The correspondence of each bit is explained below. Here, the signal is normally "1", and is set to "0" when an emergency stop occurs.

22-10-0) Built-in PLC Stop state

This indicates that the emergency stop state was entered because the user PLC's RUN/STOP switch was set to STOP or set to "STOP" by the RUN/STOP operation on the PLC onboard screen.

The user PLC's RUN/STOP switch is set with the rotary switch NCSYS on the control unit. (Normal: 0, at STOP: 1)

This will also occur if the remote I/O unit's 5 V/24 V input is in the abnormal state.

22-10-4) Control unit EMG connector Emergency stop state

This indicates that the 24V has not supplied to the control unit emergency stop input because the emergency stop switch was pressed, etc.

22-10-6) Built-in PLC Software emergency stop output device Y29F is "1".

This indicates that the user PLC has entered the emergency stop state.

The PLC device "Y29F" is the PLC emergency stop interface.

22-10-B) User PLC Illegal codes exist.

The user PLC has illegal codes.

22-10-C) PLC high-speed processing error

The high-speed processing time is over.

22-10-D) Door interlock, dog/OT arbitrary allocation device illegal

The device No. of door interlock•dog/OT arbitrary allocation overlaps another signal, or that is specified with an illegal No.

22-10-E) Spindle drive unit emergency stop output

This indicates that the spindle controller is in the emergency stop state.

22-10-F) Servo drive unit emergency stop output

This indicates that the servo controller is in the emergency stop state.

5. Explanation of Read/Write Data

23-10	Spindle command speed (Effective value)
-------	---

[Data definition]

This is not the spindle function (S) command value, but instead is the commanded speed that is obtained by adding the conditions such as spindle override, spindle stop and spindle gear shift to the S command.

[Data unit, range]

The data unit is r/min, and the setting range is 0 to 32767 (binary).

24-1	Power ON time
------	---------------

[Data definition]

This is the total cumulative time from when the controller power is turned ON to when it is turned OFF.

[Data unit]

The read data is a binary, and is not a time unit.

The following calculation is carried out to change the data to time (unit: second).

$$\text{Time (second)} = \boxed{\text{DDB read data}} \times \frac{512}{9000}$$

The reverse calculation is carried out to write the data.

$$\boxed{\text{DDB write data}} = \frac{9000}{512} \times \text{time}$$

24-2	Automatic operation time
------	--------------------------

[Data definition]

This is the total cumulative time per machining time from when the automatic start button is pressed in the memory (tape) mode to when the M02/M30 command is issued, or to when the reset process is carried out by pressing the reset button.

[Data unit]

The read data is a binary, and is not a time unit.

The following calculation is carried out to change the data to time (unit: second).

$$\text{Time (second)} = \boxed{\text{DDB read data}} \times \frac{512}{9000}$$

The reverse calculation is carried out to write the data.

$$\boxed{\text{DDB write data}} = \frac{9000}{512} \times \text{time}$$

5. Explanation of Read/Write Data

24-3	Automatic start up time
------	-------------------------

[Data definition]

This is the total cumulative time of automatic starting from when the automatic start button is pressed in the memory (tape) mode or MDI mode to when the feedhold stop, block stop or reset button is pressed.

[Data unit]

The read data is a binary, and is not a time unit.

The following calculation is carried out to change the data to time (unit: second).

$$\text{Time (second)} = \boxed{\text{DDB read data}} \times \frac{512}{9000}$$

The reverse calculation is carried out to write the data.

$$\boxed{\text{DDB write data}} = \frac{9000}{512} \times \text{time}$$

24-4	External cumulative time 1
24-5	External cumulative time 2

[Data definition]

This counts and displays the total cumulative time that the designated signal (Y234, Y235) is ON with the user PLC. The signals are assigned in the following manner.

24-4 External cumulative time 1: Y234

24-5 External cumulative time 2: Y235

[Data unit]

The read data is a binary, and is not a time unit.

The following calculation is carried out to change the data to time (unit: second).

$$\text{Time (second)} = \boxed{\text{DDB read data}} \times \frac{512}{9000}$$

The reverse calculation is carried out to write the data.

$$\boxed{\text{DDB write data}} = \frac{9000}{512} \times \text{time}$$

5. Explanation of Read/Write Data

26-10	Spindle Motor real speed
--------------	---------------------------------

[Data definition]

This is the real speed of the spindle motor detected by the encoder built into the motor.

[Data unit]

The data unit is r/min.

[Precaution]

This signal is limited to the "MDS-*-SP/SPH/SPJ2" spindle controller.

26-20	Spindle Motor load
--------------	---------------------------

[Data definition]

This is the load (torque current) of the spindle motor.

$$\text{Spindle motor load (\%)} = \left| \boxed{\text{Read data}} \right| \quad (\text{An absolute value is retrieved.})$$

5. Explanation of Read/Write Data

27-10	Smoothing status, servo status
-------	--------------------------------

[Data definition]

The various servo related information is expressed in bit units.

27-10-0) Ready ON

If the drive amplifier can be entered the ready ON state, including the ready ON request signal from the CNC, the main circuit will be turned ON. While the main circuit is ON, the ready ON signal will turn ON as the answer signal to the CNC.

The conditions for turning OFF are as follows:

- 1) When the ready ON request signal from the CNC turns OFF.
- 2) When the CNC enters the emergency stop state.
- 3) When a servo alarm occurs.

27-10-1) Servo ON

When the above ready ON signal is ON and the servo ON request signal is received from the CNC, if the conditions provide that the servo can be turned ON, the servo ON signal will turn ON (a position loop will be structured). The servo ON signal will remain ON as the answer signal to the CNC while the position loop is structured.

The condition for turning OFF is as follows:

- 1) When in addition to the conditions for the ready ON signal to remain OFF, the servo ON request signal from the CNC turns OFF.

27-10-2) In emergency stop

This is the signal answered by the drive unit when it receives notice that the CNC is in the emergency stop state. **E7** will be displayed on the 7-segment display for drive unit diagnosis.

27-10-3) In alarm

This notifies that the drive unit is in the servo OFF state.

27-10-4) Absolute position established

This turns ON when the absolute position has been established.

27-10-5) Z phase passed

This means that the datum point (Z phase) has been passed by the axis movement after the power was turned ON.

The servo parameter "SPEC" value in the setup parameters determines which datum point (Z phase) is valid among the points output by detector.

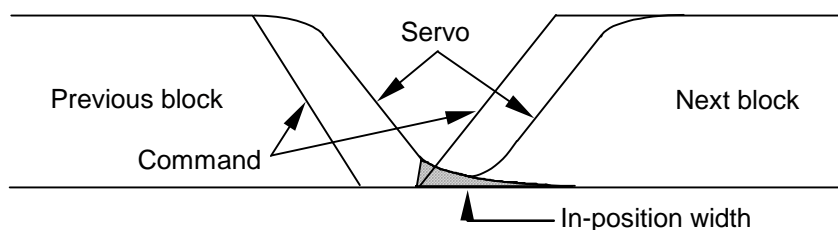
The CNC will determine the reference point return position, etc., based on this signal.

Once turned ON, this signal remains ON until it is turned OFF.

27-10-6) In-position

This indicates that the difference of the command and the feedback from the detector, or in other words, the position deflection (position loop droop) is within the range designated by the servo parameter "INP" (in-position width) in the setup parameters.

How the CNC operates upon receiving this signal depends on the basic specification parameter "inpos" (in-position check valid) in the setup parameters.



5. Explanation of Read/Write Data

27-10-7) Torque limit

This notifies that the motor drive current has been limited.

The current limit parameter will follow the ILMT (limit values for both + and – directions) in the servo parameters of the setup parameters.

27-10-8) Smoothing 0

The acceleration/deceleration time constant to make the machine movement smooth is applied to the issued step-state command. The circuit onto which the acceleration/deceleration time constant is applied is called the smoothing circuit.

Smoothing 0 means that there is no droop amount in that smoothing circuit.

(Note 1) This may turn ON when the machine is moving at an extremely low speed.

(Note 2) This state is equivalent to when the plus motion (+) signal (MVPn) and the minus motion (-) signal (MVMn) sent from the CNC to the PLC are both OFF.

27-10-9) Smoothing (+)

This indicates that there is a (+) droop amount (movement in the + direction) in the smoothing circuit described in section 27-10-8).

(Note 1) This may turn OFF when the machine is moving at an extremely low speed.

(Note 2) This state is equivalent to the plus motion (+) signal (MVPn) sent from the CNC to the PLC.

27-10-A) Smoothing (-)

This indicates that there is a (-) droop amount (movement in the – direction) in the smoothing circuit described in section 27-10-8).

(Note 1) This may turn OFF when the machine is moving at an extremely low speed.

(Note 2) This state is equivalent to the minus motion (-) signal (MVPn) sent from the CNC to the PLC.

27-10-C) Hardware OT+ (hardware overtravel)

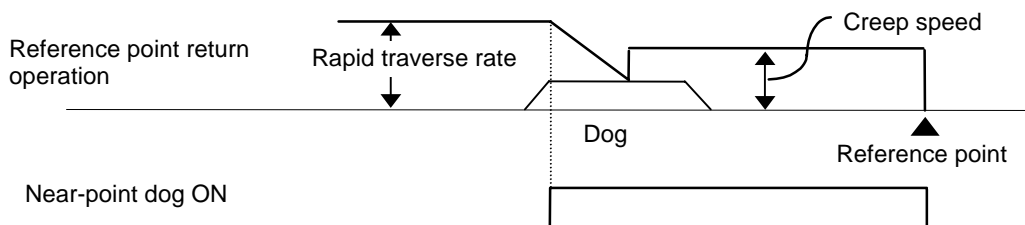
This indicates that the stroke end (+) signal was input for an axis moving in the (+) direction. Once the conditions are met, the signal will turn ON and the axis will move in the (-) direction. And when the stroke end (+) signal is no longer input, this signal will turn OFF.

27-10-D) Hardware OT– (hardware overtravel)

This indicates that the stroke end (-) signal was input for an axis moving in the (-) direction. Once the conditions are met, the signal will turn ON and the axis will move in the (+) direction. And when the stroke end (-) signal is no longer input, this signal will turn OFF.

27-10-E) Near-point dog ON

This turns ON when the reference point return near-point detection signal (dog) for the axis is detected while executing the dog-type reference point return. This turns OFF when the reference point is reached.



27-10-F) Amp. unequipped

This turns ON when the amplifier is not connected or in the equal state to that.

- When the drive unit is not correctly connected.
- When the drive unit power is OFF.
- When the drive unit axis No. switch is illegal.

5. Explanation of Read/Write Data

27-20	Servo delay amount
-------	--------------------

[Data definition]

This is an amount that indicates the difference of the actual machine position from the commanded position. (With code (+) or (-).)

The servo delay amount will be the same as the droop on the diagnosis screen's servo monitor, according to the following equation.

$$\text{Droop [command unit]} = \left| \boxed{\text{Read data}} \right| \times \frac{1}{2}$$

27-30	Feed axis motor load A (%)
-------	----------------------------

[Data definition]

This is the load of the feed axis motor.

The data read with the DDB has a code (+ or -).

$$\text{Feed axis motor load (\%)} = \left| \boxed{\text{Read data}} \right| \quad (\text{An absolute value is retrieved.})$$

[Precaution]

The motor data is data that considers the motor type. Thus, conversion may not be required depending on the motor type.

27-31	Feed axis motor load B (%)
-------	----------------------------

[Data definition]

This is the load (current) of the feed axis motor.

$$\text{Feed axis motor load (\%)} = \left| \boxed{\text{Read data}} \right| \quad (\text{An absolute value is retrieved.})$$

(Note) The same contents as the feed axis motor load A (27-30) are obtained for the feed axis motor load B.

To read the feed axis motor load, use the feed axis motor load A (27-30).

27-33	Feed axis motor speed (r/min)
-------	-------------------------------

[Data definition]

This is the speed of the feed axis motor.

The data read with the DDB has a code (+ or -).

$$\text{Feed axis motor speed (r/min)} = \left| \boxed{\text{Read data}} \right| \quad (\text{An absolute value is retrieved.})$$

5. Explanation of Read/Write Data

29/32-10	Variable command (common variable values 1, 2)
----------	--

[Data definition]

These are common variables used by the variable commands and user macros.

The sub-section No. of the DDB uses the same value as the variable No. to be read or written.

Type	Common variable 1	Common variable 2	Function
200 sets	500 to 599	100 to 199	These can be used in the main, sub and each macro program.

[Precautions]

- (1) When data is changed during operation:
 - The data will not be effective on a block that has already been calculated.
- (2) The substitute command is executed when the command block is executed (ACT).
- (3) When handling decimal place with the DDB, the last four digits of the data read or written correspond to the decimal place when the control signal bit 2 is set to "1".

5. Explanation of Read/Write Data

30-10	Local variables (level 0)
--------------	----------------------------------

[Data definition]

These are the local variables for the main program (macro level 0).

The sub-section No. of the DDB uses the same value as the local variable No. to be read or written.

[Precautions]

(1) When data is changed during operation:

(1) The data is not effective on a block that has already been calculated.

(2) The variable is cleared to a blank when the macro is called.

(2) The substitute command is executed when the command block is executed (ACT).

(3) When handling decimal place with the DDB, the last four digits of the data read or written correspond to the decimal place when the control signal bit 2 is set to "1".

30-11	Local variables (level 1)
--------------	----------------------------------

[Data definition]

These are the same as the local variables (level 0), and are the local variables in macro level 1.

Note that the sub-section No. used by the DDB is the value which 100 has been added to the local variable No.

[Precaution]

These are the same as the local variables (level 0).

30-12	Local variables (level 2)
--------------	----------------------------------

[Data definition]

These are the same as the local variables (level 1), and are the local variables in macro level 2.

Note that the sub-section No. used by the DDB is the value which 200 has been added to the local variable No.

[Precaution]

These are the same as the local variables (level 0).

30-13	Local variables (level 3)
--------------	----------------------------------

[Data definition]

These are the same as the local variables (level 2), and are the local variables in macro level 3.

Note that the sub-section No. used by the DDB is the value which 300 has been added to the local variable No.

[Precaution]

These are the same as the local variables (level 0).

5. Explanation of Read/Write Data

31-10	Tool compensation amount 1
--------------	-----------------------------------

[Data definition]

This is the tool offset and differs according to the distinction of shape and wear.

Without shape/wear distinction : Tool compensation amount

With shape/wear distinction : Tool length shape compensation amount

The sub-section No. used by the DDB corresponds to the tool offset No.

[Data unit, range]

Unit : 1/2 of the input unit (Either 0.5 μ m or 0.05 μ m)

Data range : -99999999 to +99999999 (binary)

[Precaution]

Even if this data is changed during operation, it will not be effective on a block that has already been calculated.

31-20	Tool compensation amount 2
--------------	-----------------------------------

[Data definition]

This is the tool length wear compensation amount.

(This is valid only when there is a shape/wear distinction in the tool offset.)

The sub-section No. used by the DDB is the value which 1000 has been added to the tool offset No.

[Data unit, range]

Unit : 1/2 of the input unit (Either 0.5 μ m or 0.05 μ m)

Data range : -99999 to +99999 (binary)

[Precaution]

Even if this data is changed during operation, it will not be effective on a block that has already been calculated.

31-30	Tool compensation amount 3
--------------	-----------------------------------

[Data definition]

This is the tool radius shape compensation amount.

(This is valid only when there is a shape/wear distinction in the tool offset.)

The sub-section No. used by the DDB is the value which 6000 has been added to the tool offset No. The following is the same as tool compensation amount 1.

31-40	Tool compensation amount 4
--------------	-----------------------------------

[Data definition]

This is the tool radius wear compensation amount.

(This is valid only when there is a shape/wear distinction in the tool offset.)

The sub-section No. used by the DDB is the value which 7000 has been added to the tool offset No. The following is the same as the tool compensation amount 2.

5. Explanation of Read/Write Data

31-100	X axis tool length compensation amount
---------------	---

[Data definition]

This is the X axis tool length compensation amount.

The sub-section No. used by the DDB corresponds to the tool offset No.

[Data unit, range]

Unit : 1/2 of the input unit. (Either 0.5 μ m or 0.05 μ m)

Data range : -99999999 to +99999999 (binary)

[Precaution]

Even if this data is changed during operation, it will not be effective on a block that has already been calculated.

31-110	X axis wear compensation amount
---------------	--

[Data definition]

This is the X axis wear compensation amount.

The sub-section No. used by the DDB is the value which 1000 has been added to the tool offset No.

[Data unit, range]

Unit : 1/2 of the input unit. (Either 0.5 μ m or 0.05 μ m)

Data range : 0 to 99999 (binary)

[Precaution]

Even if this data is changed during operation, it will not be effective on a block that has already been calculated.

31-120	3rd axis tool length compensation amount
---------------	---

[Data definition]

This is the 3rd tool length compensation amount.

The sub-section No. used by the DDB is the value which 2000 has been added to the tool offset No.

The following is the same as the X axis tool length compensation amount.

31-130	3rd axis wear compensation amount
---------------	--

[Data definition]

This is the 3rd axis wear compensation amount.

The sub-section No. used by the DDB is the value which 3000 has been added to the tool offset No.

The following is the same as the X axis wear compensation amount.

5. Explanation of Read/Write Data

31-140	Z axis tool length compensation amount
---------------	---

[Data definition]

This is the Z axis tool length compensation amount
 The sub-section No. used by the DDB is the value which 4000 has been added to the tool offset No.
 The following is the same as the X axis tool length compensation amount.

31-150	Z axis wear compensation amount
---------------	--

[Data definition]

This is the Z axis wear compensation amount.
 The sub-section No. used by the DDB is the value which 5000 has been added to the tool offset No.
 The following is the same as the X axis wear compensation amount.

31-160	Nose R compensation amount
---------------	-----------------------------------

[Data definition]

This is the nose R compensation amount.
 The sub-section No. used by the DDB is the value which 6000 has been added to the tool offset No.
 The following is the same as the X axis tool length compensation amount.

31-170	Nose R wear compensation amount
---------------	--

[Data definition]

This is the nose R wear compensation amount.
 The sub-section No. used by the DDB is the value which 7000 has been added to the tool offset No.
 The following is the same as the X axis wear compensation amount.

31-180	Hypothetical nose No.
---------------	------------------------------

[Data definition]

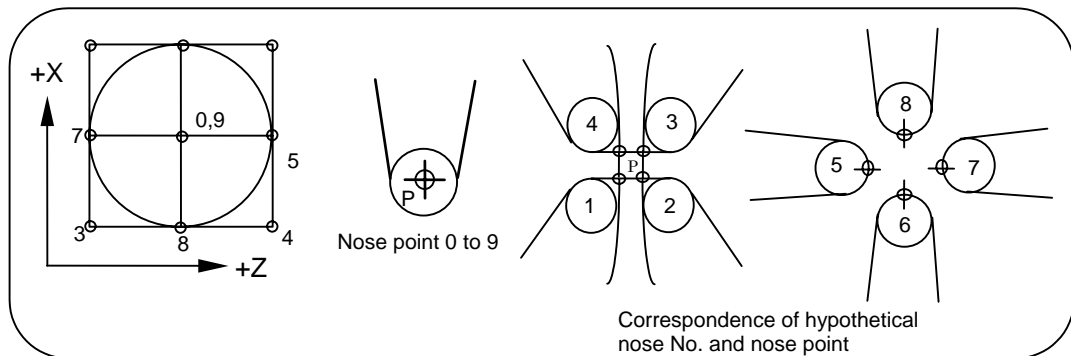
This is the hypothetical nose No.

(1) Nose point

Generally, the tool nose is rounded, so the nose position in the program is aligned to point P as shown in the following example.

With nose R compensation, select one point from the points shown below for each tool No., and preset this position relation.

(In the G46 mode, 1 to 8 are selected, and in the G41/G42 mode, 0 to 9 are selected.)



The sub-section No. used by the DDB is the value which 8000 has been added to the tool offset No.

5. Explanation of Read/Write Data

180-10 to 180-26	J2-CT parameter
---------------------	-----------------

[Data definition]

Refer to the list of parameters in the "MR-J2-CT Series Specifications and Instruction Manual" for the definitions of the J2-CT (auxiliary axis) parameters.

[Data unit, range]

Refer to the list of parameters in the "MR-J2-CT Series Specifications and Instruction Manual".

[Precaution]

Multiple J2-CT axes (up to the number of auxiliary axes) can be read with one DDB.
 The parameters can be written for only one axis with one DDB.
 Before writing the parameters, always confirm that the "writing J2-CT parameter status" and "requesting J2-CT parameter write flag" on the "J2-CT status" (section No. 180, sub-section No. 655326) are OFF.

180-40	J2-CT status
--------	--------------

[Data definition]

The J2-CT status is the status indicating the command to the J2-CT and command state from the J2-CT.

The J2-CT status is common data regardless of the axis.

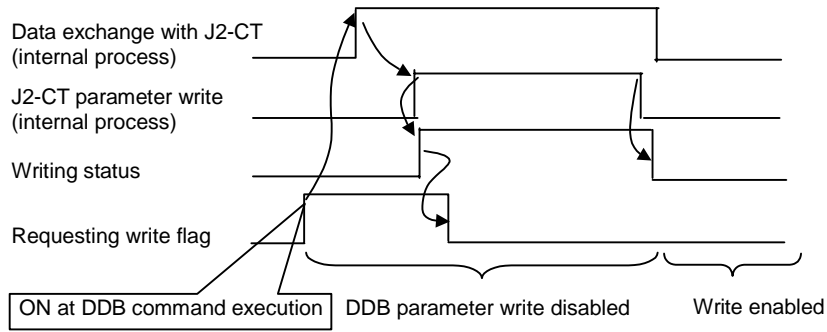
The meanings of the J2-CT status bits are shown below. Statuses with an "-" in the following table are invalid.

bit	Rn+6	Rn+7
0	-	-
1	J2-CT parameter Writing status (Note 1)	J2-CT parameter Requesting write flag (Note 2)
2	-	-
3	-	-
4	-	-
5	-	-
6	-	-
7	-	-
8	-	-
9	-	-
A	-	-
B	-	-
C	-	-
D	-	-
E	-	-
F	-	-

(Note 1) The J2-CT parameter Writing status is turned ON by the internal process while the parameters are being written to the J2-CT.

(Note 2) The J2-CT parameter Requesting write flag is turned ON when the DDB command is executed, and remains ON while parameter writing is requested to the J2-CT. It turns OFF when the writing status turns ON.

5. Explanation of Read/Write Data

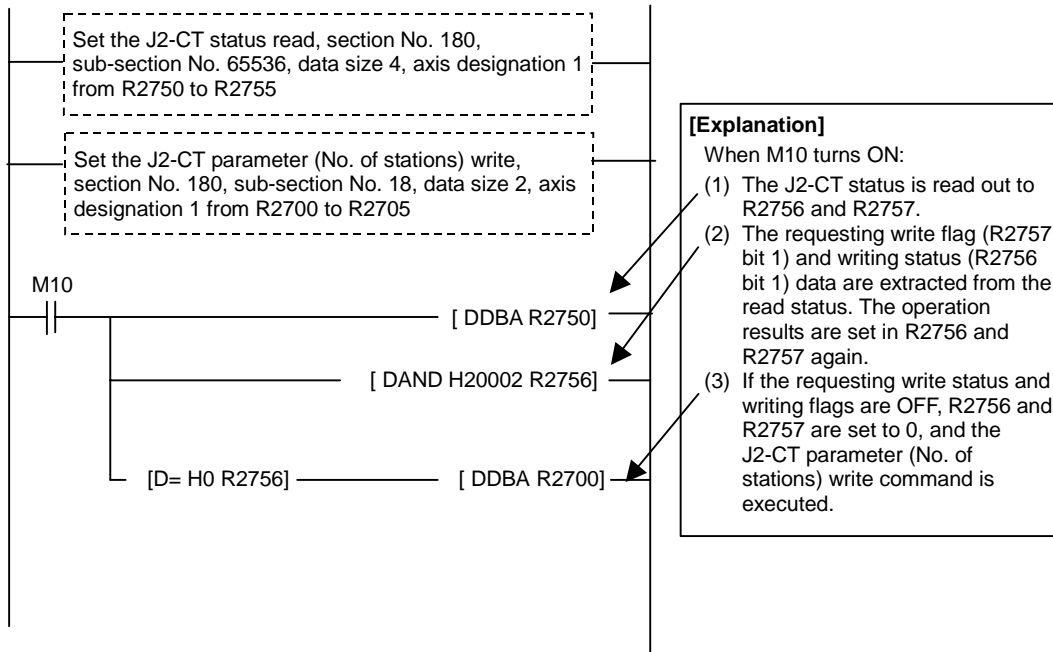


[Precaution]

- (1) The J2-CT status must be read as the axis No.1 data.
- (2) Set the data size to Long (4-byte).
- (3) The J2-CT status cannot be written.
- (4) Always write the J2-CT parameters after confirming that the writing J2-CT parameter status and requesting J2-CT parameter write flag are OFF.

[Examples of using J2-CT status]

An example of using J2-CT parameter write (No. of stations) is shown below.
 (Refer to the PLC Programming Manual for details on the DDBA I/F.)

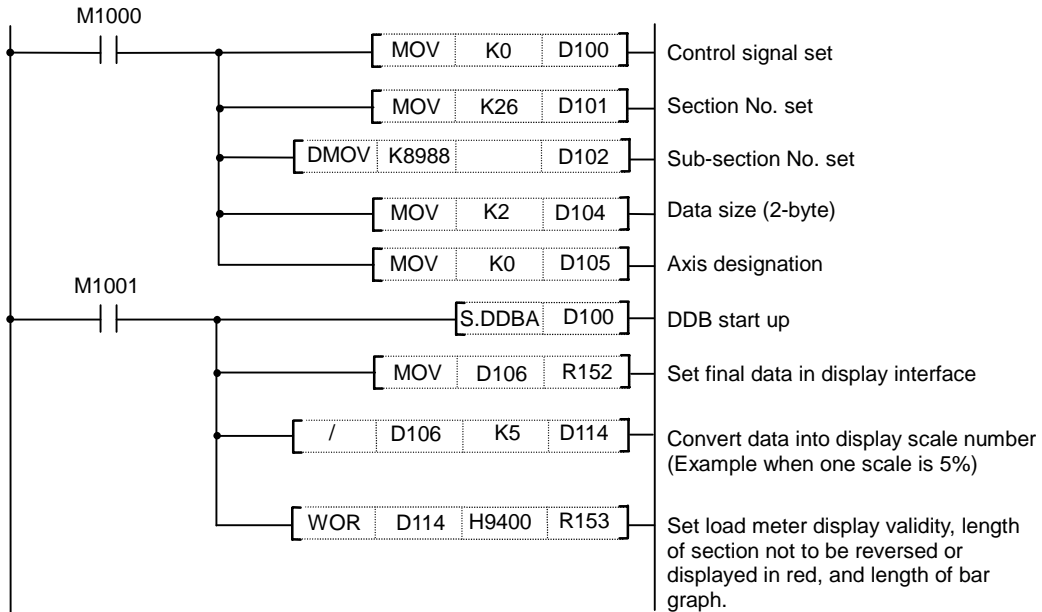


6. Example of DDB with Ladder Circuit

(1) Axis load

The spindle load can be read in, and can be displayed on the CNC screen by using the load meter display function in the PLC.

Refer to the section on the PLC Auxiliary Functions in the "PLC Programming Manual" for details on the load meter display.



D100	Control signal = 0
D101	Section No. = 26
D102	Sub-section No. = 8988
D103	
D104	Data size = 2
D105	Axis designation = insignificant
D106	Data read out
D107	

About M1000 and M1001 of example described above

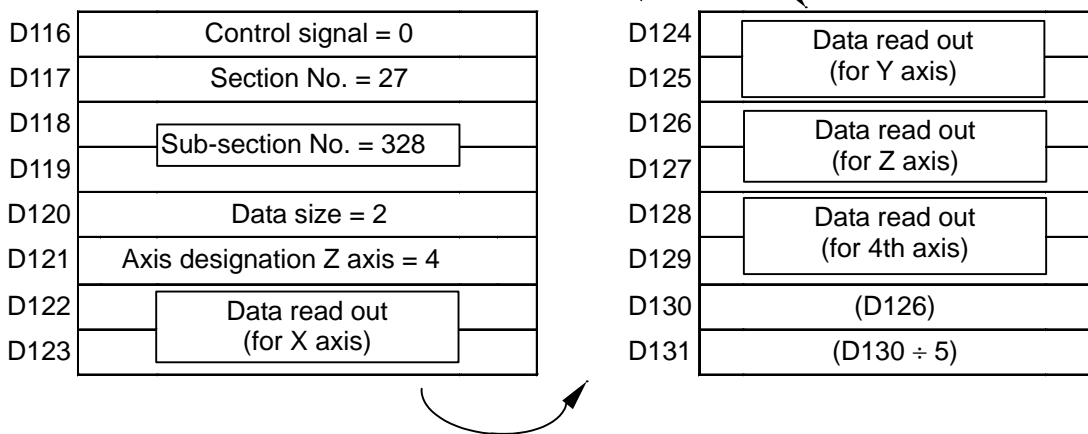
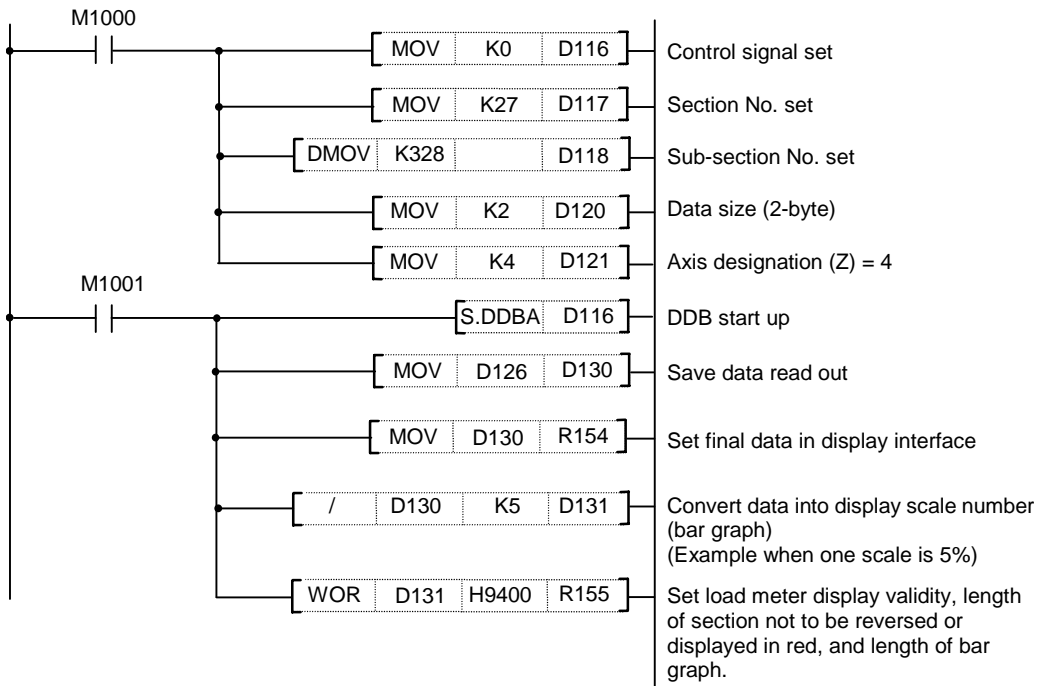
M1000: Controlled by the ladder so as to turn ON when the DDB data is set.

M1001: Controlled by the ladder so as to turn ON when the DDB is started.

6. Example of DDB with Ladder Circuit

(2) Z axis load

The Z axis load can be read in, and can be displayed on the CNC screen by using the load meter display function in the PLC.



In this example, only the Z axis data is read out, and the previous states are held for the X, Y and 4th axis data.

About M1000 and M1001 of example described above

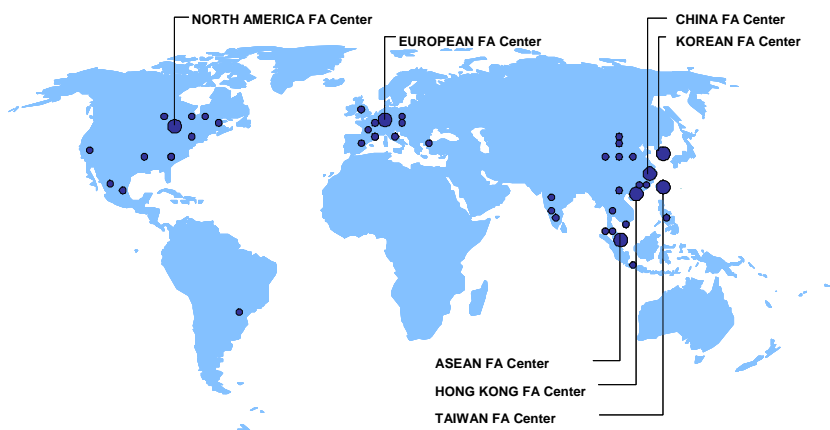
M1000: Controlled by the ladder so as to turn ON when the DDB data is set.

M1001: Controlled by the ladder so as to turn ON when the DDB is started.

Revision History

Date of revision	Manual No.	Revision details
Mar. 2006	IB(NA)-1500180-A	First edition created.

Global service network



North America FA Center (MITSUBISHI ELECTRIC AUTOMATION INC.)

Illinois CNC Service Center
500 CORPORATE WOODS PARKWAY, VERNON HILLS, IL. 60061, U.S.A.
TEL: +1-847-478-2500 (Se) FAX: +1-847-478-2650 (Se)

California CNC Service Center
5665 PLAZA DRIVE, CYPRESS, CA. 90630, U.S.A.
TEL: +1-714-220-4796 FAX: +1-714-229-3818

Georgia CNC Service Center
2810 PREMIERE PARKWAY SUITE 400, DULUTH, GA., 30097, U.S.A.
TEL: +1-678-258-4500 FAX: +1-678-258-4519

New Jersey CNC Service Center
200 COTTONTAIL LANE SOMERSET, NJ. 08873, U.S.A.
TEL: +1-732-560-4500 FAX: +1-732-560-4531

Michigan CNC Service Satellite
2545 38TH STREET, ALLEGAN, MI., 49010, U.S.A.
TEL: +1-847-478-2500 FAX: +1-269-673-4092

Ohio CNC Service Satellite
62 W. 500 S., ANDERSON, IN., 46013, U.S.A.
TEL: +1-847-478-2608 FAX: +1-847-478-2690

Texas CNC Service Satellite
1000, NOLEN DRIVE SUITE 200, GRAPEVINE, TX. 76051, U.S.A.
TEL: +1-817-251-7468 FAX: +1-817-416-1439

Canada CNC Service Center
4299 14TH AVENUE MARKHAM, ON. L3R 0J2, CANADA
TEL: +1-905-475-7728 FAX: +1-905-475-7935

Mexico CNC Service Center
MARIANO ESCOBEDO 69 TLALNEPANTLA, 54030 EDO. DE MEXICO
TEL: +52-55-9171-7662 FAX: +52-55-9171-7698

Monterrey CNC Service Satellite
ARGENTINA 3900, FRACC. LAS TORRES, MONTERREY, N.L., 64720, MEXICO
TEL: +52-81-8365-4171 FAX: +52-81-8365-4171

Brazil MITSUBISHI CNC Agent Service Center (AUTOMOTION IND. COM. IMP. E EXP. LTDA.)
ACESSO JOSE SARTORELLI, KM 2.1 18550-000 BOITUVA – SP, BRAZIL
TEL: +55-15-3363-9900 FAX: +55-15-3363-9911

European FA Center (MITSUBISHI ELECTRIC EUROPE B.V.)

Germany CNC Service Center
GOTHAER STRASSE 8, 40880 RATINGEN, GERMANY
TEL: +49-2102-486-0 FAX: +49-2102486-591

South Germany CNC Service Center
KURZE STRASSE. 40, 70794 FILDERSSTADT-BONLANDEN, GERMANY
TEL: +49-711-3270-010 FAX: +49-711-3270-0141

France CNC Service Center
25, BOULEVARD DES BOUVETS, 92741 NANTERRE CEDEX FRANCE
TEL: +33-1-41-02-83-13 FAX: +33-1-49-01-07-25

Lyon CNC Service Satellite

U.K CNC Service Center
TRAVELLERS LANE, HATFIELD, HERTFORDSHIRE, AL10 8XB, U.K.
TEL: +44-1707-282-846 FAX: +44-1707-278-992

Italy CNC Service Center
ZONA INDUSTRIALE VIA ARCHIMEDE 35 20041 AGRATE BRIANZA, MILANO ITALY
TEL: +39-039-60531-342 FAX: +39-039-6053-206

Spain CNC Service Satellite
CTRA. DE RUBI, 76-80 -APDO. 420 08190 SAINT CUGAT DEL VALLES, BARCELONA SPAIN
TEL: +34-935-65-2236 FAX:

Turkey MITSUBISHI CNC Agent Service Center (GENEL TEKNİK SİSTEMLER LTD. STI.)
DARULACEZE CAD. FAMAS IS MERKEZI A BLOK NO.43 KAT2 80270 OKMEYDANI ISTANBUL, TURKEY
TEL: +90-212-320-1640 FAX: +90-212-320-1649

Poland MITSUBISHI CNC Agent Service Center (MPL Technology Sp. z. o. o.)
UL SŁICZNA 34, 31-444 KRAKOW, POLAND
TEL: +48-12-632-28-85 FAX:

Wrocław MITSUBISHI CNC Agent Service Satellite (MPL Technology Sp. z. o. o.)
UL KOBIERZYCKA 23, 52-315 WROCLAW, POLAND
TEL: +48-71-333-77-53 FAX: +48-71-333-77-53

Czech MITSUBISHI CNC Agent Service Center (AUTOCONT CONTROL SYSTEM S.R.O.)
NEMOCNICNI 12, 702 00 OSTRAVA 2 CZECH REPUBLIC
TEL: +420-596-152-426 FAX: +420-596-152-112

ASEAN FA Center (MITSUBISHI ELECTRIC ASIA PTE. LTD.)

Singapore CNC Service Center
307 ALEXANDRA ROAD #05-01/02 MITSUBISHI ELECTRIC BUILDING SINGAPORE 159943
TEL: +65-6473-2308 FAX: +65-6476-7439

Thailand MITSUBISHI CNC Agent Service Center (F. A. TECH CO., LTD)
898/19,20,21,22 S.V. CITY BUILDING OFFICE TOWER 1 FLOOR 12,14 RAMA III RD BANGPONGPANG, YANNAWA, BANGKOK 10120. THAILAND
TEL: +66-2-682-6522 FAX: +66-2-682-6020

Malaysia MITSUBISHI CNC Agent Service Center (FLEXIBLE AUTOMATION SYSTEM SDN. BHD.)
60, JALAN USJ 10/1B UEP SUBANG JAYA SELANGOR DARUL EHSAN MALAYSIA
TEL: +60-3-5631-7605 FAX: +60-3-5631-7636

JOHOR MITSUBISHI CNC Agent Service Satellite (FLEXIBLE AUTOMATION SYSTEM SDN. BHD.)
NO. 16, JALAN SHAHBANDAR 1, TAMAN UNGKU TUN AMINAH, 81300 SKUDAI, JOHOR MALAYSIA
TEL: +60-7-557-8218 FAX: +60-7-557-3404

Indonesia MITSUBISHI CNC Agent Service Center (PT. AUTOTEKNINDO SUMBER MAKMUR)
WISMA NUSANTARA 14TH FLOOR JL. M.H. THAMRIN 59, JAKARTA 10350 INDONESIA
TEL: +62-21-3917-144 FAX: +62-21-3917-164

India MITSUBISHI CNC Agent Service Center (MESSUNG SALES & SERVICES PVT. LTD.)
B-36FF, PAVANA INDUSTRIAL PREMISES M.I.D.C., BHOASRI PUNE 411026, INDIA
TEL: +91-20-2711-9484 FAX: +91-20-2712-8115

BANGALORE MITSUBISHI CNC Agent Service Satellite (MESSUNG SALES & SERVICES PVT. LTD.)
S 615, 6TH FLOOR, MANIPAL CENTER, BANGALORE 560001, INDIA
TEL: +91-80-509-2119 FAX: +91-80-532-0480

Delhi MITSUBISHI CNC Agent Parts Center (MESSUNG SALES & SERVICES PVT. LTD.)
1197, SECTOR 15 PART-2, OFF DELHI-JAIPUR HIGHWAY BEHIND 32ND MILESTONE GURGAON 122001, INDIA
TEL: +91-98-1024-8895 FAX:

Philippines MITSUBISHI CNC Agent Service Center (FLEXIBLE AUTOMATION SYSTEM CORPORATION)
UNIT No.411, ALABAMG CORPORATE CENTER KM 25, WEST SERVICE ROAD SOUTH SUPERHIGHWAY, ALABAMG MUNTINLUPA METRO MANILA, PHILIPPINES 1771
TEL: +63-2-807-2416 FAX: +63-2-807-2417

Vietnam MITSUBISHI CNC Agent Service Center (SA GIANG TECHNO CO., LTD)
47-49 HOANG SA ST. DAKAO WARD, DIST.1 HO CHI MINH CITY, VIETNAM
TEL: +84-8-910-4763 FAX: +84-8-910-2593

China FA Center (MITSUBISHI ELECTRIC AUTOMATION (SHANGHAI) LTD.)

China CNC Service Center
2/F, BLOCK 5 BLDG.AUTOMATION INSTRUMENTATION PLAZA, 103 CAOBAO RD. SHANGHAI 200233, CHINA
TEL: +86-21-6120-0808 FAX: +86-21-6494-0178

Shenyang CNC Service Center
TEL: +86-24-2397-0184 FAX: +86-24-2397-0185

Beijing CNC Service Satellite
9/F, OFFICE TOWER1, HENDERSON CENTER, 18 JIANGUOMENNEI DAJIE, DONGCHENG DISTRICT, BEIJING 100005, CHINA
TEL: +86-10-6518-8830 FAX: +86-10-6518-8030

China MITSUBISHI CNC Agent Service Center (BEIJING JIAYOU HIGHTECH TECHNOLOGY DEVELOPMENT CO.)
RM 709, HIGH TECHNOLOGY BUILDING NO.229 NORTH SI HUAN ZHONG ROAD, HAIDIAN DISTRICT, BEIJING 100083, CHINA
TEL: +86-10-8268-3030 FAX: +86-10-6518-8030

Tianjin CNC Service Satellite
RM909, TAIHONG TOWER, NO220 SHIZILIN STREET, HEBEI DISTRICT, TIANJIN, CHINA 300143
TEL: +86-22-2653-9090 FAX: +86-22-2635-9050

Shenzhen CNC Service Satellite
RM02, UNIT A, 13/F, TIANAN NATIONAL TOWER, RENMING SOUTH ROAD, SHENZHEN, CHINA 518005
TEL: +86-755-2515-6691 FAX: +86-755-8218-4776

Changchun Service Satellite
TEL: +86-431-50214546 FAX: +86-431-5021690

Hong Kong CNC Service Center
UNIT A, 25/F RYODEN INDUSTRIAL CENTRE, 26-38 TA CHUEN PING STREET, KWAI CHUNG, NEW TERRITORIES, HONG KONG
TEL: +852-2619-8588 FAX: +852-2784-1323

Taiwan FA Center (MITSUBISHI ELECTRIC TAIWAN CO., LTD.)
Taichung CNC Service Center
NO.8-1, GONG YEH 16TH RD., TAICHUNG INDUSTRIAL PARK TAICHUNG CITY, TAIWAN R.O.C.
TEL: +886-4-2359-0688 FAX: +886-4-2359-0689

Taipei CNC Service Satellite
TEL: +886-4-2359-0688 FAX: +886-4-2359-0689

Tainan CNC Service Satellite
TEL: +886-4-2359-0688 FAX: +886-4-2359-0689

Korean FA Center (MITSUBISHI ELECTRIC AUTOMATION KOREA CO., LTD.)

Korea CNC Service Center
DONGSEO GAME CHANNEL BLDG. 2F. 660-11, DEUNGCHON-DONG KANGSEO-KU SEOUL, 157-030 KOREA
TEL: +82-2-3660-9607 FAX: +82-2-3663-0475

Notice

Every effort has been made to keep up with software and hardware revisions in the contents described in this manual. However, please understand that in some unavoidable cases simultaneous revision is not possible.

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