NCGuide
FOCAS2 Function

OPERATOR'S MANUAL

Contents

1 INTRODUCTION

This manual describes how to use FOCAS2 library for NCGuide.
For the specification of NCGuide, please refer to "NCGuide CNC Simulation Function OPERATOR'S MANUAL" and "NCGuide PMC Simulation Function OPERATOR'S MANUAL" supplied in the following NCGuide DVD disk.

NCGuide drawing number list:

NCGuide(1 user)	A08B-9010-J770#ZZ12
NCGuide(10 users)	A08B-9010-J771#ZZ12
NCGuide(20 users)	A08B-9010-J772#ZZ12
NCGuide(Site license)	A08B-9010-J773#ZZ12

And for specification of FOCAS2 Library, please refer to the “data window library specification” supplied in CNC Application Development Kit (A08B-9010-J555#ZZ12).

1.1 Features

- FOCAS2 application made by MTB can be executed without actual machine and CNC. (NOTE1)
- FOCAS2 application executed on NCGuide can be executed on actual machine without modification. (NOTE2)
- This function corresponds to the High Speed Serial Bus(HSSB) connection and the Ethernet(equal with embedded Ethernet) connection.

NOTE
1 It is necessary to set the PMC simulation function of NCGuide for using the FOCAS2 function.
2 The change of Node number(case of HSSB connection) or IP address(case of Ethernet connection) are necessary for acquiring the library handle. Please refer to "Allocates the Library handle" for acquisition of the Library handle.
And please refer to “1.2 Limitations” for other limitation.

1.2 Limitations

NCGuide differs from actual CNC, because of the difference of CPU hardware performance and of configuration of servo/spindle, or so on.
So, all function executable in CNC cannot be executed.

The main dissimilitude of NCGuide and CNC is as follows.

- CNC simulation function and PMC simulation function of the NCGuide have dissimilitude with CNC. Please refer to ”NCGuide CNC Simulation Function OPERATOR’S MANUAL” and ”NCGuide PMC Simulation Function OPERATOR’S MANUAL” for each dissimilitude.

- When the FOCAS2 function which is not prepared CNC option in NCGuide is executed, the function returns EW_NOOPT(6).
  Please refer to “9.1 OPTION SETTINGS” of ”NCGuide CNC Simulation Function OPERATOR’S MANUAL” for available CNC options.

NOTE
FOCAS2 function on NCGuide and CNC does not have complete interchangeability. Therefore, please do the operation test of FOCAS2 application on actual CNC after confirming the application on NCGuide.

2 Operating environment

The environment that NCGuide operate is necessary.
Please refer to “3. OPREATING ENVIRONMENT” of “NCGuide CNC Simulation Function OPERATOR'S MANUAL” for operating environment of NCGuide.

3 Settings

The required setting for executing FOCAS2 Application on NCGuide is explained.

3.1 Options

"Extended driver and library function" option must be set for executing FOCAS2 function on NCGuide. To enable this function, the option setting tool (OptionSetting.exe) is started after starting NCGuide. Check the check box of the "Extended driver and library function" and finish the option setting tool. And restart NCGuide.
Please refer to "9.1 OPTION SETTINGS" of "NCGuide CNC Simulation Function OPERATOR'S MANUAL" for use of the option setting tool.

It is not necessary to set the option for Ethernet connection, because Ethernet connection is equal to embedded Ethernet function.

3.2 CNC Parameters

The CNC parameters to use FOCAS2 function are the same as actual CNC. Please refer to specification of each function of “data window library specification” in CNC Application Development Kit (A08B-9010-J555#ZZ12) for detail of setting.

4 Execution method of FOCAS2 application

To execute FOCAS2 function on NCGuide, it is necessary to install "FOCAS2 library for NCGuide". FOCAS2 library for NCGuide is included in "FOCAS2 Library¥Fwlib" folder of CNC Application Development Kit (A08B-9010-J555#ZZ12).

4.1 Installation of FOCAS2 Libraries

FOCAS2 Libraries for NCGuide are as follows. The libraries except HSSB connection use the same library as actual CNC.

For 32 bit version FOCAS2 library

- Fwlib32.dll : CNC/PMC Data window control library
- FwlibNCG.dll : Processing library for HSSB connection : Exclusive use for NCGuide of FS31i/32i/35i and FS0i-F
- Fwlib0DN.dll : Processing library for HSSB connection : Exclusive use for NCGuide of FS0i-D
- Fwlibe1.dll : Processing library for Ethernet connection

For 64 bit version FOCAS2 library

- Fwlib64.dll : CNC/PMC Data window control library
- FwlibNCG64.dll : Processing library for HSSB connection : Exclusive use for NCGuide of FS31i/32i/35i and FS0i-F
- Fwlib0DN64.dll : Processing library for HSSB connection : Exclusive use for NCGuide of FS0i-D
- Fwlibe64.dll : Processing library for Ethernet connection

Please copy the library into the folder of the system environment variable "path" of Windows or into the same folder as the FOCAS2 application.
Installing to the Windows¥System32 folder is recommended.

Additionally, the header file and the import library necessary to develop the FOCAS2 application are the same as actual CNC.

4.2 HSSB driver

The installation of the HSSB driver is unnecessary.

4.3 Ethernet connection

The Ethernet port is mounted in the personal computer, and it is necessary to install the network driver.

4.4 Allocates the Library handle

To execute FOCAS2 application on NCGuide, it is necessary to get the library handle as well as actual CNC.

1) HSSB connection

The library handle is got by the following functions.

- cnc_allclibhndl : Allocate the library handle
- cnc_allclibhndl2 : Allocate the library handle(for multi-connection)

The node number of the NCGuide for FS31i/32i/35i, FS0i-F and FS0i-D are "9".
If you use cnc_allclibhndl, please specify the Node number "9" by cnc_setdefnode (Set the default node number).

2) Ethernet connection

The library handle is got by the following function.

- cnc_allclibhndl3 : Allocate the library handle(for Ethernet connection)

For connecting IP address, specify the IP address from which NCGuide is executed.
Please refer to the “10.2 ETHERNET SETTING IN PC” of "NCGuide PMC Simulation Function OPERATOR'S MANUAL" for setting of FOCAS2/Ethernet(Port number) of NCGuide.

NOTE

The screen for the Ethernet setting is prepared on the screen of NCGuide as well as actual CNC, but when FOCAS2/Ethernet function of NCGuide is used, this setting is invalid.

5 FOCAS2 Functions

The specification of the FOCAS2 library for NCGuide is the same as the description of "Data window library specification" of CNC Application Development Kit (A08B-9010-J555#ZZ12).

- The reading/writing of inner information displayed on the CNC screen of NCGuide is possible.
- When data is written, the data is reflected in the NCGuide at once.

The main FOCAS2 function which is not available function on NCGuide is as follows.

- Function related to data server
- Function related to servo learning data
- Function related to Unsolicited messaging function
- Function related to PROFIBUS-DP

The available FOCAS2 function on NCGuide is as follows.
"HSSB" on the list means HSSB connection and "Ether" means Ethernet connection.

O	Available function on NCGuide.
X	Not available function on NCGuide.
-	Not supported function on FS31i/32i/35i, FS0i-F, FS0i-D.

5.1 CNC : Function related to library handle, node

	Function Name	Brief description	FS31i/32i/35i, FS0i-F		FS0i-D	
			HSSB	Ether	HSSB	Ether
1	cnc_rdnodenum	Read the number of node	X	-	X	-
2	cnc_rdnodeinfo	Read the information of node	X	-	X	-
3	cnc_setdefnode	Set the default node number	O	-	O	-
4	cnc_allclibhndl	Allocate library handle	O	-	O	-
5	cnc_allclibhndl2	Allocate the library handle(for multi-connection)	O	-	O	-
6	cnc_allclibhndl3	Get the library handle	-	O	-	O
7	cnc_freelibhndl	Free library handle	O	O	O	O
8	cnc_settimeout	Set timeout interval	-	O	-	O
9	cnc_getlibopt	Get a library option	O	-	O	-
10	cnc_setlibopt	Set a library option	O	-	O	-

5.2 CNC : Function related to controlled axis/spindle

	Function Name	Brief description	FS31i/32i/35i, FS0i-F		FS0i-D	
			HSSB	Ether	HSSB	Ether
1	cnc_actf	Read actual axis feedrate(F)	O	O	O	O
2	cnc_absolute	Read absolute axis position	O	O	O	O
3	cnc_absolute2	Read absolute axis position 2	O	O	O	O
4	cnc_machine	Read machine axis position	O	O	O	O
5	cnc_relative	Read relative axis position	O	O	O	O
6	cnc_relative2	Read relative axis position 2	O	O	O	O
7	cnc_distance	Read distance to go	O	O	O	O
8	cnc_rdposition	Read position information	O	O	O	O
9	cnc_rdaxisdata	Read various data relating servo axis or spindle axis	O	O	O	O
10	cnc_skip	Read skip position	O	O	O	O
11	cnc_srvdelay	Read servo delay value	O	O	O	O
12	cnc_accdecdly	Read acceleration/deceleration delay value	O	O	O	O
13	cnc_rddynamic	Read all dynamic data	O	O	O	O
14	cnc_rddynamic2	Read all dynamic data (2)	O	O	O	O
15	cnc_acts	Read actual spindle speed(S)	O	O	O	O
16	cnc_acts2	Read actual spindle speed(S) (2)	X	X	X	X
17	cnc_rdspcss	Read constant surface speed data	X	X	X	X
18	cnc_rdspeed	Read speed information	O	O	O	O
19	cnc_wrrelpos	Set origin/preset relative axis position	O	O	O	O
20	cnc_prstwkcd	Preset work coordinate	O	O	O	O
21	cnc_rdmovrlap	Read manual overlapped motion value	X	X	X	X
22	cnc_canmovrlap	Cancel manual overlapped motion value	X	X	X	X
23	cnc_rdhndintrpt	Read manual overlapped motion information	X	X	X	X
24	cnc_rdspload	Read load information of serial spindle	X	X	X	X
25	cnc_rdspmaxrpm	Read maximum r.p.m. ratio of serial spindle	X	X	X	X
26	cnc_rdspgear	Read gear ratio of serial spindle	X	X	X	X
27	cnc_rdsvmeter	Read servo load meter	O	O	O	O
28	cnc_rdspmeter	Read spindle load meter	X	X	X	X
29	cnc_rdaxisname	Read axis name	O	O	O	O
30	cnc_exaxisname	Read the name of controlled axis and spindle name	O	O	O	O
31	cnc_rdspdlname	Read spindle name	O	O	O	O
32	cnc_rd5axmandt	Read the data for the manual feed for 5-axis machining	X	-	X	-
33	cnc_rd5axovrlap	Read the machine axis movement for the manual feed for 5-axis machining	X	-	X	-
34	cnc_clr5axpls	Clear the pulse amount for manual feed for 5-axis machining	X	-	X	-

5.3 CNC : Function related to CNC program

	Function Name	Brief description	FS31i/32i/35i, FS0i-F		FS0i-D	
			HSSB	Ether	HSSB	Ether
1	cnc_dwnstart	Start downloading NC program	O	-	O	-
2	cnc_download	Download NC program	O	-	O	-
3	cnc_cdownload	Download NC program(conditional)	O	-	O	-
4	cnc_dwnend	End of downloading NC program	O	-	O	-
5	cnc_dwnstart3	Start downloading NC program (3)	O	O	O	O
6	cnc_download3	Download NC program (3)	O	O	O	O
7	cnc_dwnend3	End of downloading NC program (3)	O	O	O	O
8	cnc_dwnstart4	Start downloading NC program (4)	O	O	O	O
9	cnc_download4	Download NC program (4)	O	O	O	O
10	cnc_dwnend4	End of downloading NC program (4)	O	O	O	O
11	cnc_vrfstart	Start verification of NC program	X	-	X	-
12	cnc_verify	Verify NC program	X	-	X	-
13	cnc_cverify	Verify NC program(conditional)	X	-	X	-
14	cnc_vrfend	End of verification	X	-	X	-
15	cnc_vrfstart4	Start verification of NC program(4)	O	O	O	O
16	cnc_verify4	Verify NC program(4)	O	O	O	O
17	cnc_vrfend4	End of verification(4)	O	O	O	O
18	cnc_dncstart2	Start downloading DNC program (2)	O	X	O	X
19	cnc_dnc2	Download DNC program (2)	O	X	O	X
20	cnc_dncend2	End of downloading DNC program (2)	O	X	O	X
21	cnc_rddncdgndt	Read the diagnosis data of downloading DNC program	O	-	O	-
22	cnc_upstart	Start uploading NC program	O	O	O	O
23	cnc_upload	Upload NC program	O	O	O	O
24	cnc_cupload	Upload NC program(conditional)	O	O	O	O
25	cnc_upend	End of uploading NC program	O	O	O	O
26	cnc_upstart3	Start uploading NC program (3)	O	O	O	O
27	cnc_upload3	Upload NC program (3)	O	O	O	O
28	cnc_upend3	End of uploading NC program (3)	O	O	O	O
29	cnc_upstart4	Start uploading NC program (4)	O	O	O	O
30	cnc_upload4	Upload NC program (4)	O	O	O	O
31	cnc_upend4	End of uploading NC program (4)	O	O	O	O
32	cnc_search	Search specified program	O	O	O	O
33	cnc_delall	Delete all programs	O	O	O	O
34	cnc_delete	Delete specified program	O	O	O	O
35	cnc_rdprogdir2	Read program directory (2)	O	O	O	O
36	cnc_rdprogdir3	Read program directory (3)	O	O	O	O
37	cnc_rdproginfo	Read program information	O	O	O	O
38	cnc_rdprgnum	Read program number under execution	O	O	O	O
39	cnc_exeprgname	Read program name under execution	O	O	O	O
40	cnc_rdseqnum	Read sequence number under execution	O	O	O	O
41	cnc_seqsrch	Search specified sequence number	O	O	O	O
42	cnc_rewind	Rewind cursor of NC program	O	O	O	O
43	cnc_rdblkcount	Read block counter	O	O	O	O
44	cnc_rdexecprog	Read program under execution	O	O	O	O
45	cnc_wrmdiprog	Write program for MDI operation	O	O	O	O
46	cnc_rdmdipntr	Read execution pointer for MDI operation	O	O	O	O
47	cnc_wrmdipntr	Write execution pointer for MDI operation	O	O	O	O
48	cnc_rdproctime	Read processing time stamp data	O	-	O	-
49	cnc_rdprgdirtime	Read directory for processing time stamp data	O	-	O	-
50	cnc_copyprog	Copy program	O	O	O	O
51	cnc_renameprog	Change program number	O	O	O	O

	Function Name	Brief description	FS31i/32i/35i, FS0i-F		FS0i-D	
			HSSB	Ether	HSSB	Ether
52	cnc_condense	Condense program	O	O	O	O
53	cnc_rdprogline	Read NC program by line basis	O	-	O	-
54	cnc_rdprogline2	Read NC program by line basis(2)	O	-	O	-
55	cnc_wrprogline	Write NC program by line basis	O	-	O	-
56	cnc_delprogline	Delete NC program by line basis	O	-	O	-
57	cnc_searchword	Search string in NC program	O	O	O	O
58	cnc_searchresult	Get result of string search in NC program	O	O	O	O
59	cnc_rdactpt	Get execution pointer	O	-	O	-
60	cnc_wractpt	Set execution pointer	O	-	O	-
61	cnc_rdpdf_drive	Read information of Program memory drive	O	O	O	O
62	cnc_rdpdf_inf	Read information Program memory file	O	O	O	O
63	cnc_rdpdf_curdir	Read information of current folder	O	O	O	O
64	cnc_wrpdf_curdir	Set current folder	O	O	O	O
65	cnc_rdpdf_subdir	Read information of subfolder	O	O	O	O
66	cnc_rdpdf_alldir	Read file information	O	O	O	O
67	cnc_rdpdf_subdirn	Read number of subfolders or files	O	O	O	O
68	cnc_pdf_add	Create folder or file	O	O	O	O
69	cnc_pdf_del	Delete folder or file	O	O	O	O
70	cnc_pdf_delall	Delete all programs	O	O	O	O
71	cnc_pdf_rename	Rename folder or file	O	O	O	O
72	cnc_pdf_copy	Copy file	O	O	O	O
73	cnc_pdf_move	Move file	O	O	O	O
74	cnc_pdf_cond	Rearrange the contents of the program	O	O	O	O
75	cnc_wrpdf_attr	Change attribute of folder or file	O	O	O	O
76	cnc_pdf_rdmain	Read main program	O	O	O	O
77	cnc_pdf_slctmain	Select main program	O	O	O	O
78	cnc_rdpdf_line	Read NC program by line basis(For arbitrary file name)	O	-	O	-
79	cnc_wrpdf_line	Write NC program by line basis(For arbitrary file name)	O	-	O	-
80	cnc_pdf_delline	Delete NC program by line basis(For arbitrary file name)	O	-	O	-
81	cnc_pdf_searchword	Search string in NC program(For arbitrary file name)	O	O	O	O
82	cnc_pdf_searchresult	Get result of string search in NC program(For arbitrary file name)	O	O	O	O
83	cnc_pdf_rdactpt	Get execution pointer(For arbitrary file name)	O	O	O	O
84	cnc_pdf_wractpt	Set execution pointer(For arbitrary file name)	O	O	O	O

5.4 CNC : Function related to CNC file data

	Function Name	Brief description	FS31i/32i/35i, FS0i-F		FS0i-D	
			HSSB	Ether	HSSB	Ether
1	cnc_rdtofs	Read tool offset value	O	O	O	O
2	cnc_wrtofs	Write tool offset value	O	O	O	O
3	cnc_rdtofsr	Read tool offset value(area specified)	O	O	O	O
4	cnc_wrtofsr	Write tool offset value(area specified)	O	O	O	O
5	cnc_rdtofsinfo	Read tool offset information	O	O	O	O
6	cnc_rdtofsinfo2	Read tool offset information (2)	O	O	O	O
7	cnc_tofs_rnge	Read the effective setting range of tool offset value	O	O	O	O
8	cnc_rdzofs	Read work zero offset value	O	O	O	O
9	cnc_wrzofs	Write work zero offset value	O	O	O	O
10	cnc_rdzofsr	Read work zero offset value(area specified)	O	O	O	O
11	cnc_wrzofsr	Write work zero offset value(area specified)	O	O	O	O
12	cnc_rdzofsinfo	Read work zero offset information	O	O	O	O
13	cnc_zofs_rnge	Read the effective setting range of work zero offset value	O	O	O	O
14	cnc_rdparam	Read parameter	O	O	O	O
15	cnc_wrparam	Write parameter	O	O	O	O
16	cnc_rdparam3	Read parameter(3)	O	O	O	O
17	cnc_rdparar	Read parameter(area specified)	O	O	O	O
18	cnc_wrparas	Write parameter(area specified)	O	O	O	O
19	cnc_rdparam_ext	Read random number parameters	O	O	O	O
20	cnc_rdparainfo	Read parameter information	O	O	O	O
21	cnc_rdparanum	Read minimum, maximum, total number of parameter	O	O	O	O
22	cnc_rdset	Read setting data	O	O	O	O
23	cnc_wrset	Write setting data	O	O	O	O
24	cnc_rdsetr	Read setting data(area specified)	O	O	O	O
25	cnc_wrsets	Write setting data(area specified)	O	O	O	O
26	cnc_rdsetinfo	Read setting data information	O	O	O	O
27	cnc_rdsetnum	Read minimum, maximum, total number of setting data	O	O	O	O
28	cnc_rdpitchr	Read pitch error compensation data(area specified)	X	X	X	X
29	cnc_wrpitchr	Write pitch error compensation data(area specified)	X	X	X	X
30	cnc_rdpitchinfo	Read pitch error compensation data information	X	X	X	X
31	cnc_rdvolc	Read 3-dimensional error compensation data	X	X	X	X
32	cnc_wrvolc	Write 3-dimensional error compensation data	X	X	X	X
33	cnc_rdvolccomp	Read 3-dimensional error compensation value at current position	X	X	X	X
34	cnc_rdmacro	Read custom macro variable	O	O	O	O
35	cnc_wrmacro	Write custom macro variable	O	O	O	O
36	cnc_rdmacror	Read custom macro variables(area specified)	O	O	O	O
37	cnc_wrmacror	Write custom macro variables(area specified)	O	O	O	O
38	cnc_rdmacror2	Read custom macro variables(double precision)	O	O	O	O
39	cnc_wrmacror2	Write custom macro variables(double precision)	O	O	O	O
40	cnc_rdmacroinfo	Read custom macro variable information	O	O	O	O
41	cnc_getmactype	Get type of custom macro variable	O	O	O	O
42	cnc_setmactype	Set type of custom macro variable	O	O	O	O

	Function Name	Brief description	FS31i/32i/35i, FS0i-F		FS0i-D	
			HSSB	Ether	HSSB	Ether
43	cnc_rdpmacro	Read P code macro variable	O	O	O	O
44	cnc_wrpmacro	Write P code macro variable	O	O	O	O
45	cnc_rdpmacror	Read P code macro variables(area specified)	O	O	O	O
46	cnc_rdpmacror2	Read P code macro variables(double precision)	O	O	O	O
47	cnc_wrpmacror	Write P code macro variables(area specified)	O	O	O	O
48	cnc_wrpmacror2	Write P code macro variables(double precision)	O	O	O	O
49	cnc_rdpmacroinfo2	Read P code macro variable information(2)	O	-	O	-
50	cnc_getpmactype	Get type of P code macro variable	O	O	O	O
51	cnc_setpmactype	Set type of P code macro variable	O	O	O	O
52	cnc_rdmgrpdata	Read M code group data	X	X	X	X
53	cnc_wrmgrpdata	Write M code group data	X	X	X	X
54	cnc_rdintchk	Read interference check data(area specified)	O	-	O	-
55	cnc_wrintchk	Write interference check data(area specified)	O	-	O	-
56	cnc_rdintinfo	Read interference check data information	O	-	O	-
57	cnc_rdwkcdshft	Read work coordinate shift value	O	O	O	O
58	cnc_wrwkcdshft	Write work coordinate shift value	O	O	O	O
59	cnc_rdwkcdsfms	Read work coordinate shift measured value	O	O	O	O
60	cnc_wrwkcdsfms	Write work coordinate shift measured value	O	O	O	O
61	cnc_wksft_rnge	Read the effective setting range of work coordinate shift value	O	O	O	O

5.5 CNC : Function related to tool life management data

	Function Name	Brief description	FS31i/32i/35i, FS0i-F		FS0i-D	
			HSSB	Ether	HSSB	Ether
1	cnc_rdgrpid	Read tool life management data(tool group number)	O	O	O	O
2	cnc_rdgrpid2	Read tool life management data(tool group number) 2	O	O	O	O
3	cnc_rdngrp	Read tool life management data(number of tool groups)	O	O	O	O
4	cnc_rdntool	Read tool life management data(number of tools)	O	O	O	O
5	cnc_rdlife	Read tool life management data(tool life)	O	O	O	O
6	cnc_rdcount	Read tool life management data(tool life counter)	O	O	O	O
7	cnc_rd1length	Read tool life management data(tool length number-1)	O	O	O	O
8	cnc_rd2length	Read tool life management data(tool length number-2)	O	O	O	O
9	cnc_rd1radius	Read tool life management data(cutter compensation num.-1)	O	O	O	O
10	cnc_rd1radius	Read tool life management data(cutter compensation num.-2)	O	O	O	O
11	cnc_t1info	Read tool life management data(tool information-1)	O	O	O	O
12	cnc_t2info	Read tool life management data(tool information-2)	O	O	O	O
13	cnc_toolnum	Read tool life management data(tool number)	O	O	O	O
14	cnc_rdtoolrng	Read tool life management data(tool number, tool life, tool life counter)(area specified)	O	O	O	O
15	cnc_rdtoolgrp	Read tool life management data(all data within group)	O	O	O	O
16	cnc_wrcountr	Write tool life management data(tool life counter)(area specified)	O	O	O	O
17	cnc_rdusegrpid	Read tool life management data(used tool group number)	O	O	O	O
18	cnc_rdmaxgrp	Read tool life management data(max. number of tool groups)	O	O	O	O
19	cnc_rdmaxtool	Read tool life management data(max. number of tool within group)	O	O	O	O
20	cnc_rdusetlno	Read tool life management data(used tool number within group)	O	O	O	O
21	cnc_rd1tlifedata	Read tool life management data(tool data1)	O	O	O	O
22	cnc_rd1tlifedat2	Read tool life management data(tool data1) 2	O	O	O	O
23	cnc_rd2tlifedata	Read tool life management data(tool data2)	O	O	O	O
24	cnc_wr1tlifedata	Write tool life management data(tool data1)	O	O	O	O
25	cnc_wr1tlifedat2	Write tool life management data(tool data1) 2	O	O	O	O
26	cnc_wr2tlifedata	Write tool life management data(tool data2)	O	O	O	O
27	cnc_rdgrpinfo	Read tool life management data(tool group information)	O	O	O	O
28	cnc_rdgrpinfo2	Read tool life management data(tool group information 2)	O	O	O	O
29	cnc_rdgrpinfo3	Read tool life management data(tool group information 3)	O	O	O	O
30	cnc_rdgrpinfo4	Read tool life management data(tool group information 4)	O	O	O	O

	Function Name	Brief description	FS31i/32i/35i, FS0i-F		FS0i-D	
			HSSB	Ether	HSSB	Ether
31	cnc_wrgrpinfo	Write tool life management data(tool group information)	O	O	O	O
32	cnc_wrgrpinfo2	Write tool life management data(tool group information 2)	O	O	O	O
33	cnc_wrgrpinfo3	Write tool life management data(tool group information 3)	O	O	O	O
34	cnc_deltlifegrp	Delete tool life management data(tool group)	O	O	O	O
35	cnc_instlifedt	Insert tool life management data(tool data)	O	O	O	O
36	cnc_deltlifedt	Delete tool life management data(tool data)	O	O	O	O
37	cnc_clrcntinfo	Clear tool life management data(tool life counter, tool information)(area specified)	O	O	O	O
38	cnc_rdtlinfo	Read tool life management data(maximum number of tool groups, maximum number of tool within group, maximum number of life count)	O	O	O	O
39	cnc_rdtlusegrp	Read tool life management data(next/current/last used tool group number)	O	O	O	O
40	cnc_rdtlgrp	Read tool life management data(tool group information) (area specified)	O	O	O	O
41	cnc_rdtltool	Read tool life management data(tool data) (area specified)	O	O	O	O
42	cnc_rdexchgtgrp	Read tool life management data(Exchange necessary tool group number)	O	O	O	O

5.6 CNC : nction related to tool management data

	Function Name	Brief description	FS31i/32i/35i, FS0i-F		FS0i-D	
			HSSB	Ether	HSSB	Ether
1	cnc_regtool	New registration of Tool management data	O	O	X	X
2	cnc_regtool_f2	New registration of Tool management data (2)	O	O	X	X
3	cnc_deltool	Delete Tool management data	O	O	X	X
4	cnc_rdtool	Read Tool management data	O	O	X	X
5	cnc_rdtool_f2	Read Tool management data (2)	O	O	X	X
6	cnc_wrtool	Write Tool management data	O	O	X	X
7	cnc_wrtool_f2	Write Tool management data (2)	O	O	X	X
8	cnc_wrtool2	Write individual data of Tool management data	O	O	X	X
9	cnc_regmagazine	New registration of Magazine management data	O	O	X	X
10	cnc_delmagazine	Delete Magazine management data	O	O	X	X
11	cnc_rdmagazine	Read Magazine management data	O	O	X	X
12	cnc_wrmagazine	Write individual data of Magazine management data	O	O	X	X
13	cnc_wrtoolgeom_tlm	Write tool geometry data	O	O	X	X
14	cnc_rdtoolgeom_tlm	Read tool geometry data	O	O	X	X

5.7 CNC : Function related to history data

	Function Name	Brief description	FS31i/32i/35i, FS0i-F		FS0i-D	
			HSSB	Ether	HSSB	Ether
1	cnc_stopophis	Stop logging operation history data	X	X	X	X
2	cnc_startophis	Restart logging operation history data	X	X	X	X
3	cnc_rdophisno	Read number of operation history data	X	X	X	X
4	cnc_rdophistry4	Read operation history data (4)	X	X	X	X
5	cnc_clearophis	Clear operation history data	X	X	X	X
6	cnc_rdhissgnl3	Read signals related operation history(3)	X	X	X	X
7	cnc_wrhissgnl3	Write signals related operation history(3)	X	X	X	X
8	cnc_rdalmhisno	Read number of alarm history data	X	X	X	X
9	cnc_rdalmhistry5	Read alarm history data (5)	X	X	X	X
10	cnc_stopomhis	Stop logging external operator's message history data	X	X	X	X
11	cnc_startomhis	Restart logging external operator's message history data	X	X	X	X
12	cnc_rdomhisno	Read number of external operator's message history data	X	X	X	X
13	cnc_rdomhistry2	Read external operator's message history data (2)	X	X	X	X
14	cnc_clearomhis	Clear external operator's message history data	X	X	X	X

5.8 CNC : Function related to servo/spindle

	Function Name	Brief description	FS31i/32i/35i, FS0i-F		FS0i-D	
			HSSB	Ether	HSSB	Ether
1	cnc_rdloopgain	Read loop gain for servo adjustment	O	O	O	O
2	cnc_rdcurrent	Read real current for servo adjustment	O	O	O	O
3	cnc_rdsrvspeed	Read real speed for servo adjustment	O	O	O	O
4	cnc_rdnspdl	Read number of spindle	O	O	O	O
5	cnc_rdopmode	Read operation mode for spindle setting	X	X	X	X
6	cnc_rdposerrs	Read position deflection S for spindle adjustment	X	X	X	X
7	cnc_rdposerrs2	Read position deflection S1,S2 for spindle adjustment(synchronous control mode)	X	X	X	X
8	cnc_rdposerrz	Read position deflection Z of tapping axis for spindle adjustment(rigid tapping mode)	X	X	X	X
9	cnc_rdsynerrsy	Read synchronous error for spindle adjustment(synchronous control mode)	X	X	X	X
10	cnc_rdsynerrrg	Read synchronous error for spindle adjustment(rigid tapping mode)	X	X	X	X
11	cnc_rdspdlalm	Read spindle alarm for spindle monitor	X	X	X	X
12	cnc_rdctrldi	Read control input signal for spindle monitor	X	X	X	X
13	cnc_rdctrldo	Read control output signal for spindle monitor	X	X	X	X

5.9 CNC : Function Reference related to data server

	Function Name	Brief description	FS31i/32i/35i, FS0i-F		FS0i-D	
			HSSB	Ether	HSSB	Ether
1	eth_rdparam	Get the parameter of Ethernet	X	-	X	-
2	eth_wrparam	Set the parameter of Ethernet	X	-	X	-
3	eth_rddsmode	Get the mode of DATA SERVER	X	-	X	-
4	eth_wrdsmode	Set the mode of DATA SERVER	X	-	X	-
5	eth_rddsstate	Get the maintenance information on DATA SERVER	X	-	X	-
6	eth_rdhost	Get the connection host number of Ethernet	X	-	X	-
7	eth_wrhost	Set the connection host number of Ethernet	X	-	X	-
8	eth_rddsm198dir	Get the connection host number of Ethernet	X	-	X	-
9	eth_wrdsm198dir	Set the connection host number of Ethernet	X	-	X	-
10	eth_rddsm198host	Get the folder for M198 operation of DATA SERVER	X	-	X	-
11	eth_wrdsm198host	Set the folder for M198 operation of DATA SERVER	X	-	X	-
12	eth_rddsformat	Get the format form of the ATA card of DATA SERVER	X	-	X	-
13	eth_dsformat	Format of the ATA card of DATA SERVER	X	-	X	-
14	eth_dschkdsk	Check disk of the ATA card of DATA SERVER	X	-	X	-
15	cnc_rddsdncfile	Get file for DNC operation	X	-	X	-
16	cnc_wrdsdncfile	Set file for DNC operation	X	-	X	-
17	cnc_rddsdevinfo	Get memory device information on DATA SERVER	X	-	X	-
18	cnc_rddsdir	Get current folder	X	-	X	
19	cnc_rddsfile	Get file list information	X	-	X	-
20	cnc_dsmkdir	Make folder	X	-	X	-
21	cnc_dsrmdir	Delete folder	X	-	X	-
22	cnc_dsremove	Delete file	X	-	X	-
23	cnc_dschdir	Change current foledr	X	-	X	-
24	cnc_dsrename	Change folder name or file name	X	-	X	-
25	cnc_dscopyfile	Copy file of DATA SERVER	X	-	X	-
26	cnc_dsget_req	Start GET of DATA SERVER	X	-	X	-
27	cnc_dsput_req	Start PUT of DATA SERVER	X	-	X	-
28	cnc_dsmget_req	Start MGET of DATA SERVER	X	-	X	-
29	cnc_dsmput_req	Start MPUT of DATA SERVER	X	-	X	-
30	cnc_dslistget_req	Start List-GET of DATA SERVER	X	-	X	-
31	cnc_dslistput_req	Start List-PUT of DATA SERVER	X	-	X	-
32	cnc_dslistdel_req	Start List-DEL of DATA SERVER function	X	-	X	-
33	cnc_dsftpstat	Read file transfer result of DATA SERVER	X	-	X	-
34	cnc_dsftpcancel	Stop file transfer of DATA SERVER	X	-	X	-

5.10 CNC : Function Reference related to servo learning data

	Function Name	Brief description	FS31i/32i/35i, FS0i-F		FS0i-D	
			HSSB	Ether	HSSB	Ether
1	cnc_svdtstartrd	Start of reading servo learning data	X	-	X	-
2	cnc_svdtrddata	Reading of the data from I/F buffer for the servo learning data	X	-	X	-
3	cnc_svdtendrd	End of reading servo learning data	X	-	X	-
4	cnc_svdtstartwr	Start of writing servo learning data	X	-	X	-
5	cnc_svdtwrdata	Writing of the data to I/F buffer for the servo learning data	X	-	X	-
6	cnc_svdtendwr	End of writing servo learning data	X	-	X	-
7	cnc_svdtstopexec	Stop of reading/writing of the servo learning data	X	-	X	-

5.11 CNC : Function related to Unsolicited messaging function

	Function Name	Brief description	FS31i/32i/35i, FS0i-F		FS0i-D	
			HSSB	Ether	HSSB	Ether
1	cnc_wrunsolicprm2	Set the unsolicited messaging parameters (2)	-	X	-	X
2	cnc_rdunsolicprm2	Get the unsolicited messaging parameters (2)	-	X	-	X
3	cnc_rdunsolicmsg2	Read the unsolicited messaging data (2)	-	X	-	X

5.12 PMC : Function related to PMC

	Function Name	Brief description	FS31i/32i/35i, FS0i-F		FS0i-D	
			HSSB	Ether	HSSB	Ether
1	pmc_rdpmcrng	Read PMC data(area specified)	O	O	O	O
2	pmc_wrpmcrng	Write PMC data(area specified)	O	O	O	O
3	pmc_rdpmcinfo	Read PMC data information	O	O	O	O
4	pmc_rdcntldata	Read control data of PMC data table	O	O	O	O
5	pmc_wrcntldata	Write control data of PMC data table	O	O	O	O
6	pmc_rdcntlgrp	Read the sum total group of control data	O	O	O	O
7	pmc_wrcntlgrp	Write the sum total group of control data	O	O	O	O
8	pmc_set_timer_type	Set the PMC timer type	O	O	O	O
9	pmc_get_timer_type	Get the PMC timer type	O	O	O	O
10	pmc_getdtailerr	Get detail error for PMC	O	O	O	O
11	pmc_rdalmmsg	Read PMC alarm messages	O	O	O	O
12	pmc_rdprmstart	Start uploading PMC parameter	O	-	O	-
13	pmc_rdpmcparam	Upload PMC parameter	O	-	O	-
14	pmc_rdprmend	End of uploading PMC parameter	O	-	O	-
15	pmc_wrprmstart	Start downloading PMC parameter	O	-	O	-
16	pmc_wrpmcparam	Download PMC parameter	O	-	O	-
17	pmc_wrprmend	End of downloading PMC parameter	O	-	O	-
18	pmc_select_pmc_unit	Select the PMC	O	O	O	O
19	pmc_get_current_pmc_unit	Get the current PMC unit type	O	O	O	O
20	pmc_get_number_of_pmc	Read the number of existing PMC paths	O	O	O	O
21	pmc_get_pmc_unit_types	Read the PMC system information	O	O	O	O

5.13 PMC : Function Reference related to PROFIBUS-DP

	Function Name	Brief description	FS31i/32i/35i, FS0i-F		FS0i-D	
			HSSB	Ether	HSSB	Ether
1	pbm_rd_param	Reading of the parameters of the PROFIBUS master function	X	X	X	X
2	pbm_wr_param	Setting the parameters of the PROFIBUS master function	X	X	X	X
3	pbm_ini_prm	Initialization of the specified parameters of the PROFIBUS master function	X	X	X	X
4	pbm_rd_allslvtbl	Reading of all slave table	X	X	X	X
5	pbm_exe_subfunc	Execution of sub-function	X	X	X	X
6	pbm_rd_subprm	Reading of the setting assistant parameters	X	X	X	X
7	pbm_rd_errcode	Reading of an error code	X	X	X	X
8	pbm_chg_mode	Change of the operation mode	X	X	X	X
9	pbm_rd_cominfo	Reading of the communicating information	X	X	X	X
10	pbm_rd_nodetable	Reading of status of connected slave	X	X	X	X
11	pbm_rd_nodeinfo	Reading of the information of slave station	X	X	X	X
12	pbm_rd_slot	Reading of the number of slot on master function	X	X	X	X
13	pbm_rd_slotinfo	Reading of the slot information on master function	X	X	X	X
14	pbs_rd_param	Reading of the parameters of the PROFIBUS slave function	X	X	X	X
15	pbs_wr_param	Setting of the parameters of the PROFIBUS slave function	X	X	X	X
16	pbs_ini_prm	Initialization of the parameters of the PROFIBUS slave function	X	X	X	X
17	pbs_rd_cominfo	Reading of the communication state of the PROFIBUS slave function	X	X	X	X
18	pbs_rd_param2	Reading of the parameters of the PROFIBUS slave function(2)	X	X	X	X
19	pbs_wr_param2	Setting of the parameters of the PROFIBUS slave function(2)	X	X	X	X
20	pbs_rd_cominfo2	Reading of the communication state of the PROFIBUS slave function(2)	X	X	X	X

5.14 CNC : Function related to others

	Function Name	Brief description	FS31i/32i/35i, FS0i-F		FS0i-D	
			HSSB	Ether	HSSB	Ether
1	cnc_sysinfo	Read CNC system information	O	O	O	O
2	cnc_sysinfo_ex	Read CNC system information(2)	O	O	O	O
3	cnc_statinfo	Read CNC status information	O	O	O	O
4	cnc_statinfo2	Read CNC status information(2)	O	O	O	O
5	cnc_alarm	Read alarm status	O	O	O	O
6	cnc_alarm2	Read alarm status (2)	O	O	O	O
7	cnc_rdalminfo	Read alarm information	O	O	O	O
8	cnc_rdalmmsg	Read alarm message	O	O	O	O
9	cnc_rdalmmsg2	Read alarm message (2)	O	O	O	O
10	cnc_modal	Read modal data	O	O	O	O
11	cnc_rdgcode	Read G modal code	O	O	O	O
12	cnc_rdcommand	Read commanded data	O	O	O	O
13	cnc_diagnoss	Read diagnosis data	O	O	O	O
14	cnc_diagnosr	Read diagnosis data(area specified)	O	O	O	O

	Function Name	Brief description	FS31i/32i/35i, FS0i-F		FS0i-D	
			HSSB	Ether	HSSB	Ether
15	cnc_rddiag_ext	Read random number diagnosis data	O	O	O	O
16	cnc_rddiaginfo	Read diagnosis data information	O	O	O	O
17	cnc_rddiagnum	Read minimum, maximum, total number of diagnosis data	O	O	O	O
18	cnc_adcnv	Read A/D conversion data	O	O	O	O
19	cnc_rdopmsg	Read operator's message	O	O	O	O
20	cnc_rdopmsg2	Read operator's message (2)	O	O	O	O
21	cnc_rdopmsg3	Read operator's message (3)	O	O	O	O
22	cnc_setpath	Set path number(for multi-path)	O	O	O	O
23	cnc_getpath	Get path number(for multi-path)	O	O	O	O
24	cnc_rdprstrinfo	Read program restart information	O	O	O	O
25	cnc_rstrseqsrch	Search sequence number for program restart	O	O	O	O
26	cnc_rdopnlsgnl	Read output signal image of software operator's panel	X	X	X	X
27	cnc_wropnlsgnl	Write output signal of software operator's panel	X	X	X	X
28	cnc_rdopnlgnrl	Read general signal image of software operator's panel	X	X	X	X
29	cnc_wropnlgnrl	Write general signal image of software operator's panel	X	X	X	X
30	cnc_rdopnlgsname	Read general signal name of software operator's panel	X	X	X	X
31	cnc_wropnlgsname	Write general signal name of software operator's panel	X	X	X	X
32	cnc_getdtailerr	Get detail error for CNC	O	O	O	O
33	cnc_getfigure	Read maximum valid figures, number of decimal places	O	O	O	O
34	cnc_rdsyssoft3	Read series/version of CNC system software (3)	X	X	X	X
35	cnc_rdsyshard	Read of CNC hardware configuration	X	X	X	X
36	cnc_gettimer	Get calendar timer of CNC	O	O	O	O
37	cnc_settimer	Set calendar timer of CNC	X	X	X	X
38	cnc_reset	CNC reset	O	O	O	O
39	cnc_reset2	CNC reset (2)	O	-	O	-
40	cnc_clralm	Clear CNC alarm	O	O	O	O
41	cnc_rdcexesram	Read SRAM variable area for C language executor	X	X	X	X
42	cnc_wrcexesram	Write SRAM variable area for C language executor	X	X	X	X
43	cnc_cexesramsize	Read maximum size of SRAM variable area for C language executor	X	X	X	X
44	cnc_rdetherinfo	Read Ethernet board information	-	X	-	X
45	cnc_rdcoordnum	Read additional workpiece coordinate systems number	O	-	O	-
46	cnc_rdpm_mcnitem	Read machine specific maintenance item	O	O	O	O
47	cnc_wrpm_mcnitem	Write machine specific maintenance item	O	O	O	O
48	cnc_rdpm_item	Read maintenance item status	O	O	O	O
49	cnc_wrpm_item	Write maintenance item status	O	O	O	O