FOCAS2/Ethernet for Linux OPERATOR'S MANUAL

Edition 2

1 Overview

In this manual, FOCAS2/Ethernet for Linux is described.

Available Linux distributions are as follows:
- Ubuntu （i386 – For 32-bit Intel/AMD (x86)）　　　version 12.04 LTS
- Ubuntu （armhf – For 32-bit ARM （ARMv7)）　　　version 12.04 LTS
- Ubuntu （i386 – For 32-bit Intel/AMD (x86)）　　　version 16.04 LTS
- Ubuntu （amd64 - For 64-bit Intel/AMD (x86_64)）　version 16.04 LTS
- Ubuntu （armhf – For 32-bit ARM （ARMv7)）　　　version 16.04 LTS

Available CNCs are as follows:
- FANUC Series 30i /31i /32i /35i-MODEL B
- FANUC Series 31i-MODEL B5
- FANUC Power Motion i-MODEL A
- FANUC Series 0i-MODEL D/F

NOTE

.As for the details of the Linux distributions, see the following web sites.
- Ubuntu　　　: http://www.ubuntu.com/

---

2 FOCAS2/Ethernet Library

> **NOTE**
> For the list of all supported functions, see "Appendix B supports FOCAS2 functions list".

2.1 Setting

Setup the FOCAS2 library as follows:

1. Copy the library file "libfocas32.so.1.0.0" to your appropriate library folder.
   (The followings are described assuming that the library is copied to "/usr/local/lib/" folder.)
2. Run the following 2 commands to register the library to Linux.
   sudo ldconfig
   sudo ln −s /usr/local/lib/libfocas32.so.1.0.0 /usr/local/lib/libfocas32.so

> **NOTE**
> For linux, FOCAS2 library has the same name "libfocas32.so" on 32bit and 64 bit.

2.2 Application Development

Before you develop an application utilizing the FOCAS2 library, install GNU Compiler Collection (hereafter GCC) version 4.6.3 or later.
As for the way to install, see the Web site of GCC "http://gcc.gnu.org/".

When you build an application, link the following libraries by specifying the link option "-lfwlib32 -lstdc++ -lpthread" of GCC.

- FOCAS2/Ethernet library （focas32）
- GNU Standard C++ library (stdc++)
- POSIX thread library (pthread)

2.3 FOCAS2 Function for Linux

The FOCAS2 library saves its contents of the communication log to a file.
However, in Linux, each file and folder has permission to access and a file cannot be saved in a folder without proper permission.
So, before getting the library handle, make the log file in a folder with permission to read and write for your application by calling the FOCAS2 function "cnc_startupprocess".

> **NOTE**
> For the details of the cnc_startupprocess function, see "A.1 cnc_startupprocess function".

2.4   Notes

The multi-thread in POSIX is available with the FOCAS2 functions.

After getting a library handle, do not invoke fork() system call. Otherwise, the FOCAS2 functions returns the socket error (EW_SOCKET) in a child process created by fork().

2.5   About type of long

In 32bit Linux OS , type of long have 32bit length. But in 64bit Linux OS, type of long have 64bit length.

To absorb this difference, we define type of LONG and ULONG.

LONG and ULONG defined to type of 32bit length.

If you use focas2 on Linux, please replace long and unsigned long to LONG and ULONG on Function Reference.

※64bit Linux is LP64(long and pointer is 64bit).

2.6   Redistribution and Licenses

The FOCAS2/Ethernet library for Linux can be redistributed freely.

This library is proprietary software complied by GCC through Eligible Compilation Process.

NOTE

   As for GCC and Eligible Compilation Process, see <http://www.gnu.org/licenses/gcc-exception-3.1.html>.

APPENDIX A   FOCAS2 Function for Linux

A.1   cnc_startupprocess Function

Declaration

#include "focas32.h"

FWLIBAPI short WINAPI cnc_startupprocess (long level, char* filename);

Description

Initialize the FOCAS2/Ethernet library in a process.

Arguments

level [in]

Specify the log level (0 to 3) of the communication long file.

filename [in]

Specify the file name of the communication long file to be created.

Return

EW_OK is returned on successful completion, otherwise any value except EW_OK is returned.

The major error codes are as follows.

Return code	Meaning/Error handling
EW_NUMBER (3)	Data number error The log level (level) is wrong.

NOTE
- Be sure to call this function before getting a library handle. If an application gets a library handle before call the function, the FOCAS library outputs "FOCAS2 log file is not found" to a stdout and signals SIGABRT in an application, then an application will be terminated.
- Do not call this function two or more times. If you call it again by specifying the log file which is different from before, the last specified file becomes valid.

A.2   cnc_exitprocess Function

Declaration

#include "focas32.h"

FWLIBAPI short WINAPI cnc_exitprocess( );

Description

Frees all library handles which have been allocated in the current process by this function at the exit of the process.

Arguments

Nothing

Return

EW_OK is returned on successful completion, otherwise any value except EW_OK is returned.

A.3   cnc_exitthread Function

Declaration

    #include "focas32.h"

    FWLIBAPI short WINAPI cnc_exitthread( );

Description

    Frees all library handles which have been allocated in the current thread by this function at the exit of the thread.

Arguments

    Nothing

Return

    EW_OK is returned on successful completion, otherwise any value except EW_OK is returned.

APPENDIX B Supports FOCAS2 Functions List

CNC : Function related to library handle, node

	Function Name	Brief description	30i-B	0i-D	PM-i
1	cnc_allclibhndl3	Get the library handle	V	V	V
2	cnc_freelibhndl	Free library handle	V	V	V

V: Can be used, -: Cannot be used

CNC : Function related to controlled axis/spindle

	Function Name	Brief description	30i-B	0i-D	PM-i
1	cnc_actf	Read actual axis feedrate(F)	V	V	V
2	cnc_absolute	Read absolute axis position	V	V	V
3	cnc_absolute2	Read absolute axis position 2	V	V	V
4	cnc_machine	Read machine axis position	V	V	V
5	cnc_relative	Read relative axis position	V	V	V
6	cnc_relative2	Read relative axis position 2	V	V	V
7	cnc_distance	Read distance to go	V	V	V
8	cnc_rdposition	Read position information	V	V	V
9	cnc_rdaxisdata	Read various data relating servo axis or spindle axis	V	V	V
10	cnc_skip	Read skip position	V	V	V
11	cnc_srvdelay	Read servo delay value	V	V	V
12	cnc_accdecdly	Read acceleration/deceleration delay value	V	V	V
13	cnc_rddynamic	Read all dynamic data	V	V	V
14	cnc_rddynamic2	Read all dynamic data (2)	V	V	V
15	cnc_acts	Read actual spindle speed(S)	V	V	-
16	cnc_acts2	Read actual spindle speed(S) (2)	V	V	-
17	cnc_rdspcss	Read constant surface speed data	V	V	-
18	cnc_rdspeed	Read speed information	V	V	V
19	cnc_rdmovrlap	Read manual overlapped motion value	V	V	V
20	cnc_rdhndintrpt	Read manual overlapped motion information	V	V	V
21	cnc_rdspload	Read load information of serial spindle	V	V	-
22	cnc_rdspmaxrpm	Read maximum r.p.m. ratio of serial spindle	V	V	-
23	cnc_rdspgear	Read gear ratio of serial spindle	V	V	-
24	cnc_rdsvmeter	Read servo load meter	V	V	V
25	cnc_rdspmeter	Read spindle load meter	V	V	V
26	cnc_rdaxisname	Read axis name	V	V	-
27	cnc_exaxisname	Read the name of controlled axis and spindle name	V	-	V
28	cnc_exaxisname2	Read the name of controlled axis and spindle name(2)	V	-	V
29	cnc_rdspdlname	Read spindle name	V	V	-

V: Can be used, -: Cannot be used

CNC : Function related to CNC program

	Function Name	Brief description	30i-B	0i-D	PM-i
1	cnc_dwnstart3	Start downloading NC program (3)	V	V	V
2	cnc_download3	Download NC program (3)	V	V	V
3	cnc_dwnend3	End of downloading NC program (3)	V	V	V
4	cnc_dwnstart4	Start downloading NC program (4)	V	V	V
5	cnc_download4	Download NC program (4)	V	V	V
6	cnc_dwnend4	End of downloading NC program (4)	V	V	V
7	cnc_vrfstart4	Start verification of NC program (4)	V	V	V
8	cnc_verify4	Verify NC program (4)	V	V	V
9	cnc_vrfend4	End of verification (4)	V	V	V
10	cnc_dncstart2	Start downloading DNC program (2)	V*1	V*1	V*1
11	cnc_dnc2	Download DNC program (2)	V*1	V*1	V*1
12	cnc_dncend2	End of downloading DNC program (2)	V*1	V*1	V*1
13	cnc_rddncdgndt	Read the diagnosis data of downloading DNC program	V*1	V*1	V*1
14	cnc_upstart3	Start uploading NC program (3)	V	V	V
15	cnc_upload3	Upload NC program (3)	V	V	V
16	cnc_upend3	End of uploading NC program (3)	V	V	V
17	cnc_upstart4	Start uploading NC program (4)	V	V	V
18	cnc_upload4	Upload NC program (4)	V	V	V
19	cnc_upend4	End of uploading NC program (4)	V	V	V
20	cnc_search	Search specified program	V	V	V
21	cnc_delall	Delete all programs	V	V	V
22	cnc_delete	Delete specified program	V	V	V
23	cnc_rdprogdir2	Read program directory (2)	V	V	V
24	cnc_rdprogdir3	Read program directory (3)	V	V	V
25	cnc_rdproginfo	Read program information	V	V	V
26	cnc_rdprgnum	Read program number under execution	V	V	V
27	cnc_exeprgname	Read program name under execution	V	V	V
28	cnc_exeprgname2	Read program name under execution (2)	V	V	V
29	cnc_rdseqnum	Read sequence number under execution	V	V	V
30	cnc_seqsrch	Search specified sequence number	V	V	V
31	cnc_rewind	Rewind cursor of NC program	V	V	V
32	cnc_rdblkcount	Read block counter	V	V	-
33	cnc_rdexecprog	Read program under execution	V	V	V
34	cnc_wrmdiprog	Write program for MDI operation	V	V	V
35	cnc_rdmdipntr	Read execution pointer for MDI operation	V	V	V
36	cnc_wrmdipntr	Write execution pointer for MDI operation	V	V	V
37	cnc_copyprog	Copy program	V	V	V
38	cnc_renameprog	Change program number	V	V	V
39	cnc_condense	Condense program	V	V	V
40	cnc_searchword	Search string in NC program	V	V	V
41	cnc_searchresult	Get result of string search in NC program	V	V	V
42	cnc_rdpdf_drive	Read information of Program memory drive	V	V	V
43	cnc_rdpdf_inf	Read information Program memory file	V	V	V
44	cnc_rdpdf_curdir	Read information of current folder	V	V	V
45	cnc_wrpdf_curdir	Set current folder	V	-	V

46	cnc_rdpdf_subdir	Read information of subfolder	V	V	V
47	cnc_rdpdf_alldir	Read file information	V	V	V
48	cnc_rdpdf_subdirn	Read number of subfolders or files	V	V	V
49	cnc_pdf_add	Create folder or file	V	V	V
50	cnc_pdf_del	Delete folder or file	V	V	V
51	cnc_pdf_delall	Delete all programs	V	V	V
52	cnc_pdf_rename	Rename folder or file	V	V	V
53	cnc_pdf_copy	Copy file	V	V	V
54	cnc_pdf_move	Move file	V	V	V
55	cnc_pdf_cond	Rearrange the contents of the program	V	V	V
56	cnc_wrpdf_attr	Change attribute of folder or file	V	V	V
57	cnc_pdf_rdmain	Read main program	V	V	V
58	cnc_pdf_slctmain	Select main program	V	V	V
59	cnc_pdf_searchword	Search string in NC program(For arbitrary file name)	V	V	V
60	cnc_pdf_searchresult	Get result of string search in NC program(For arbitrary file name)	V	V	V
61	cnc_pdf_rdactpt	Get execution pointer(For arbitrary file name)	V	V	V
62	cnc_pdf_wractpt	Set execution pointer(For arbitrary file name)	V	V	V
63	cnc_saveprog_start	Starts of the manual saving for the high speed program management	V	V	-
64	cnc_saveprog_end	Get execution result of the manual saving for the high speed program management	V	V	-

V: Can be used, -: Cannot be used

*1:Cannot be used Embedded Ethernet

CNC : Function related to CNC file data

	Function Name	Brief description	30i-B	0i-D	PM-i
1	cnc_rdtofs	Read tool offset value	V	V	V
2	cnc_rdtofsr	Read tool offset value(area specified)	V	V	V
3	cnc_rdtofsinfo	Read tool offset information	V	V	V
4	cnc_rdtofsinfo2	Read tool offset information (2)	V	V	V
5	cnc_tofs_rnge	Read the effective setting range of tool offset value	V	V	V
6	cnc_rdzofs	Read work zero offset value	V	V	-
7	cnc_rdzofsr	Read work zero offset value(area specified)	V	V	-
8	cnc_rdzofsinfo	Read work zero offset information	V	V	-
9	cnc_zofs_rnge	Read the effective setting range of work zero offset value	V	V	-
10	cnc_rdparam	Read parameter	V	V	V
11	cnc_rdparam3	Read parameter(3)	V	V	V
12	cnc_rdparar	Read parameter(area specified)	V	V	V
13	cnc_rdparam_ext	Read random number parameters	V	V	V
14	cnc_rdparainfo	Read parameter information	V	-	V
15	cnc_rdparainfo3	Read parameter information (3)	V	V	V
16	cnc_rdparanum	Read minimum, maximum, total number of parameter	V	V	V
17	cnc_rdset	Read setting data	V	V	V
18	cnc_rdsetr	Read setting data(area specified)	V	V	V
19	cnc_rdsetinfo	Read setting data information	V	V	V
20	cnc_rdsetnum	Read minimum, maximum, total number of setting data	V	V	V
21	cnc_rdpitchr	Read pitch error compensation data(area specified)	V	V	V
22	cnc_rdpitchinfo	Read pitch error compensation data information	V	V	V
23	cnc_rdvolc	Read 3-dimensional error compensation data	V	-	-
24	cnc_rdvolccomp	Read 3-dimensional error compensation value at current position	V	-	-
25	cnc_rdrotvolc	Read the 3-dimensional rotary error compensation data	V	-	-
26	cnc_rdmacro	Read custom macro variable	V	V	V
27	cnc_rdmacror	Read custom macro variables(area specified)	V	V	V
28	cnc_rdmacror2	Read custom macro variables(double precision)	V	V	V
29	cnc_rdmacror3	Read custom macro variables and name(area specified)	V	V	V
30	cnc_rdmacroinfo	Read custom macro variable information	V	V	V
31	cnc_getmactype	Get type of custom macro variable	V	V	V
32	cnc_rdpmacro	Read P code macro variable	V	V	V
33	cnc_rdpmacror	Read P code macro variables(area specified)	V	V	V
34	cnc_rdpmacror2	Read P code macro variables(double precision)	V	V	V
35	cnc_rdpmacroinfo2	Read P code macro variable information(2)	V	V	V
36	cnc_getpmactype	Get type of P code macro variable	V	V	V
37	cnc_rdmgrpdata	Read M code group data	V	-	-
38	cnc_rdwkcdshft	Read work coordinate shift value	V	V	-
39	cnc_rdwkcdsfms	Read work coordinate shift measured value	V	V	-
40	cnc_wksft_rnge	Read the effective setting range of work coordinate shift value	V	V	-

V: Can be used, -: Cannot be used

CNC : Function related to tool life management data

	Function Name	Brief description	30i-B	0i-D	PM-i
1	cnc_rdgrpid	Read tool life management data(tool group number)	V	V	-
2	cnc_rdgrpid2	Read tool life management data(tool group number) 2	V	V	-
3	cnc_rdngrp	Read tool life management data(number of tool groups)	V	V	-
4	cnc_rdntool	Read tool life management data(number of tools)	V	V	-
5	cnc_rdlife	Read tool life management data(tool life)	V	V	-
6	cnc_rdcount	Read tool life management data(tool life counter)	V	V	-
7	cnc_rd1length	Read tool life management data(tool length number-1)	V	V	-
8	cnc_rd2length	Read tool life management data(tool length number-2)	V	V	-
9	cnc_rd1radius	Read tool life management data(cutter compensation num.-1)	V	V	-
10	cnc_rd2radius	Read tool life management data(cutter compensation num.-2)	V	V	-
11	cnc_t1info	Read tool life management data(tool information-1)	V	V	-
12	cnc_t2info	Read tool life management data(tool information-2)	V	V	-
13	cnc_toolnum	Read tool life management data(tool number)	V	V	-
14	cnc_rdtoolrng	Read tool life management data(tool number, tool life, tool life counter)(area specified)	V	V	-
15	cnc_rdtoolgrp	Read tool life management data(all data within group)	V	V	-
16	cnc_rdusegrpid	Read tool life management data(used tool group number)	V	V	-
17	cnc_rdmaxgrp	Read tool life management data(max. number of tool groups)	V	V	-
18	cnc_rdmaxtool	Read tool life management data(max. number of tool within group)	V	V	-
19	cnc_rdusetlno	Read tool life management data(used tool number within group)	V	V	-
20	cnc_rd1tlifedata	Read tool life management data(tool data1)	V	V	-
21	cnc_rd1tlifedat2	Read tool life management data(tool data1) 2	V	V	-
22	cnc_rd2tlifedata	Read tool life management data(tool data2)	V	V	-
23	cnc_rdgrpinfo	Read tool life management data(tool group information)	V	V	-
24	cnc_rdgrpinfo2	Read tool life management data(tool group information 2)	V	-	-
25	cnc_rdgrpinfo3	Read tool life management data(tool group information 3)	V	-	-
26	cnc_rdgrpinfo4	Read tool life management data(tool group information 4)	V	-	-
27	cnc_rdtlinfo	Read tool life management data(maximum number of tool groups, maximum number of tool within group, maximum number of life count)	V	V	-
28	cnc_rdtlusegrp	Read tool life management data(next/current/last used tool group number)	V	V	-
29	cnc_rdtlgrp	Read tool life management data(tool group information) (area specified)	V	V	-
30	cnc_rdtltool	Read tool life management data(tool data) (area specified)	V	V	-
31	cnc_rdexchgtgrp	Read tool life management data(Exchange necessary tool group number)	V	V	-

V: Can be used, -: Cannot be used

CNC : Function related to tool management data

	Function Name	Brief description	30i-B	0i-D	PM-i
1	cnc_rdtool	Read Tool management data	V	-	-
2	cnc_rdtool_f2	Read Tool management data (2)	V	-	-
3	cnc_rdmagazine	Read Magazine management data	V	-	-
4	cnc_rdtoolgeom_tlm	Read tool geometry data	V	-	-
5	cnc_btlfpotsrh	Search empty pot for oversize tool	V	-	-
6	cnc_rdmag_property	Read the magazine property data	V	-	-
7	cnc_rdpot_property	Read the pot property data	V	-	-

V: Can be used, -: Cannot be used

CNC : Function related to tool geometry size data

	Function Name	Brief description	30i-B	0i-D	PM-i
1	cnc_rdtlgeomsize_ext	Read the tool geometry size data	V	-	-

V: Can be used, -: Cannot be used

CNC : Function related to history data

	Function Name	Brief description	30i-B	0i-D	PM-i
1	cnc_stopophis	Stop logging operation history data	V	V	V
2	cnc_startophis	Restart logging operation history data	V	V	V
3	cnc_rdophisno	Read number of operation history data	V	V	V
4	cnc_rdophistry4	Read operation history data (4)	V	V	V
5	cnc_rdhissgnl3	Read signals related operation history(3)	V	V	V
6	cnc_rdalmhisno	Read number of alarm history data	V	V	V
7	cnc_rdalmhistry5	Read alarm history data (5)	V	V	V
8	cnc_stopomhis	Stop logging external operator's message history data	V	V	V
9	cnc_startomhis	Restart logging external operator's message history data	V	V	V
10	cnc_rdomhisno	Read number of external operator's message history data	V	V	V
11	cnc_rdomhistry2	Read external operator's message history data (2)	V	V	V

V: Can be used, -: Cannot be used

CNC : Function related to servo/spindle

	Function Name	Brief description	30i-B	0i-D	PM-i
1	cnc_rdloopgain	Read loop gain for servo adjustment	V	V	V
2	cnc_rdcurrent	Read real current for servo adjustment	V	V	V
3	cnc_rdsrvspeed	Read real speed for servo adjustment	V	V	V
4	cnc_rdnspdl	Read number of spindle	V	V	-
5	cnc_rdopmode	Read operation mode for spindle setting	V	V	-
6	cnc_rdposerrs	Read position deflection S for spindle adjustment	V	V	-
7	cnc_rdposerrs2	Read position deflection S1,S2 for spindle adjustment(synchronous control mode)	V	V	-
8	cnc_rdposerrz	Read position deflection Z of tapping axis for spindle adjustment(rigid tapping mode)	V	V	-
9	cnc_rdsynerrsy	Read synchronous error for spindle adjustment(synchronous control mode)	V	V	-
10	cnc_rdsynerrrg	Read synchronous error for spindle adjustment(rigid tapping mode)	V	V	-
11	cnc_rdspdlalm	Read spindle alarm for spindle monitor	V	V	-
12	cnc_rdctrldi	Read control input signal for spindle monitor	V	V	-
13	cnc_rdctrldo	Read control output signal for spindle monitor	V	V	-

V: Can be used, -: Cannot be used

PMC : Function related to PMC

	Function Name	Brief description	30i-B	0i-D	PM-i
1	pmc_rdpmcrng	Read PMC data(area specified)	V	V	V
2	pmc_rdkpm	Read data from extended backup memory	V	-	-
3	pmc_rdkpm2	Read data from extended backup memory(2)	V	-	-
4	pmc_kpmsiz	Read maximum size of extended backup memory	V	-	-
5	pmc_rdpmcinfo	Read PMC data information	V	V	V
6	pmc_rdcntldata	Read control data of PMC data table	V	V	V
7	pmc_rdcntlgrp	Read the sum total group of control data	V	V	V
8	pmc_get_timer_type	Get the PMC timer accuracy	V	V	V
9	pmc_getdtailerr	Get detail error for PMC	V	V	V
10	pmc_rdalmmsg	Read PMC alarm messages	V	V	V
11	pmc_rdpmctitle	Read PMC title data	V	V	V
12	pmc_rdprmstart	Start uploading PMC parameter	V	V	-
13	pmc_rdpmcparam	Upload PMC parameter	V	V	-
14	pmc_rdprmend	End of uploading PMC parameter	V	V	-
15	pmc_select_pmc_unit	Select the PMC	V	V	V
16	pmc_get_current_pmc_unit	Get the current PMC unit type	V	V	V
17	pmc_get_number_of_pmc	Read the number of existing PMC paths	V	V	V
18	pmc_get_pmc_unit_types	Read the PMC system information	V	V	V

V: Can be used, -: Cannot be used

CNC : Function related to others

	Function Name	Brief description	30i-B	0i-D	PM-i
1	cnc_sysinfo	Read CNC system information	V	V	V
2	cnc_sysinfo_ex	Read CNC system information(2)	V	V	V
3	cnc_statinfo	Read CNC status information	V	V	V
4	cnc_statinfo2	Read CNC status information(2)	V	V	V
5	cnc_alarm	Read alarm status	V	V	V
6	cnc_alarm2	Read alarm status (2)	V	V	V
7	cnc_rdalminfo	Read alarm information	V	V	V
8	cnc_rdalmmsg	Read alarm message	V	V	V
9	cnc_rdalmmsg2	Read alarm message (2)	V	V	V
10	cnc_modal	Read modal data	V	V	V
11	cnc_rdgcode	Read G modal code	V	V	V
12	cnc_rdcommand	Read commanded data	V	V	V
13	cnc_diagnoss	Read diagnosis data	V	V	V
14	cnc_diagnosr	Read diagnosis data(area specified)	V	V	V
15	cnc_rddiag_ext	Read random number diagnosis data	V	V	V
16	cnc_rddiaginfo	Read diagnosis data information	V	V	V
17	cnc_rddiagnum	Read minimum, maximum, total number of diagnosis data	V	V	V
18	cnc_adcnv	Read A/D conversion data	V	V	V
19	cnc_rdopmsg	Read operator's message	V	V	V
20	cnc_rdopmsg2	Read operator's message (2)	V	V	V
21	cnc_rdopmsg3	Read operator's message (3)	V	V	V
22	cnc_setpath	Set path number(for multi-path)	V	V	V
23	cnc_getpath	Get path number(for multi-path)	V	V	V
24	cnc_rdprstrinfo	Read program restart information	V	V	V
25	cnc_rstrseqsrch	Search sequence number for program restart	V	V	V
26	cnc_rdopnlsgnl	Read output signal image of software operator's panel	V	V	V
27	cnc_rdopnlgnrl	Read general signal image of software operator's panel	V	V	V
28	cnc_rdopnlgsname	Read general signal name of software operator's panel	V	V	V
29	cnc_getdtailerr	Get detail error for CNC	V	V	V
30	cnc_getfigure	Read maximum valid figures, number of decimal places	V	V	V
31	cnc_rdsyssoft3	Read series/version of CNC system software (3)	V	V	V
32	cnc_rdsyshard	Read of CNC hardware configuration	V	V	V
33	cnc_gettimer	Get calendar timer of CNC	V	V	V
34	cnc_rdcexesram	Read SRAM variable area for C language executor	V	V	V
35	cnc_cexesramsize	Read maximum size of SRAM variable area for C language executor	V	V	V
36	cnc_rdetherinfo	Read Ethernet board information	V	V	V
37	cnc_rdpm_mcnitem	Read machine specific maintenance item for periodic maintenance	V	V	V
38	cnc_rdpm_item	Read maintenance item status for periodic maintenance	V	V	V

V: Can be used, -: Cannot be used