SEICOS-pcFLexi

INSTRUCTION MANUAL

MAINTENANCE

61 Edition 1.01

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Hitachi Seiki Deutschland
Werkzeugmaschinen GmbH

CONTENTS

I. pcFLexi unit

1. OVERVIEW

The SEICOS-pcFLexi CNC unit realizes compactness and high-reliability converging latest device technologies.

1.1 System Configuration

The following figure shows a system example using SEICOS-pcFLexi CNC unit.

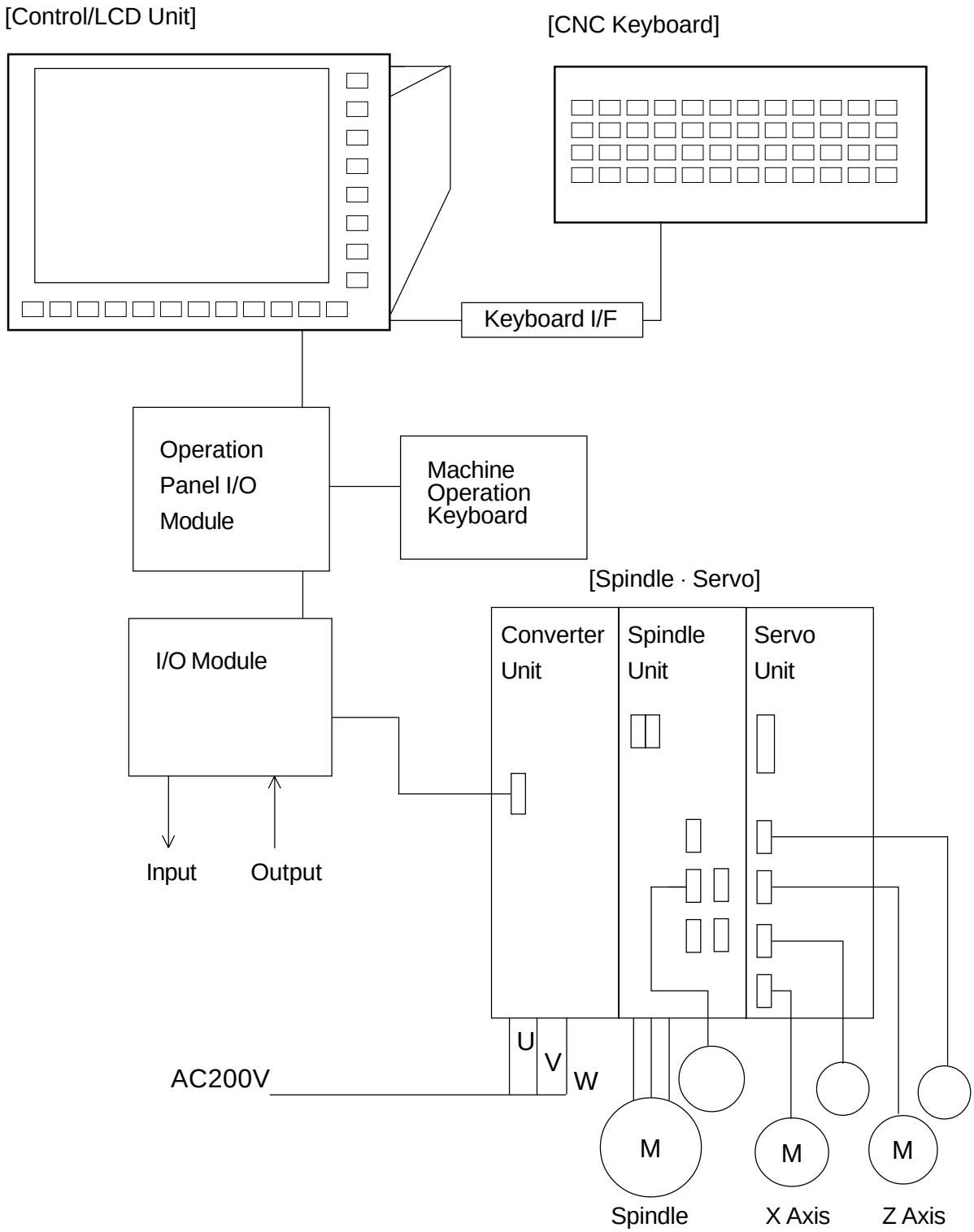


Fig.1.1 System configuration

1.2 Components Connection Diagram

The figure below shows the connection between components.

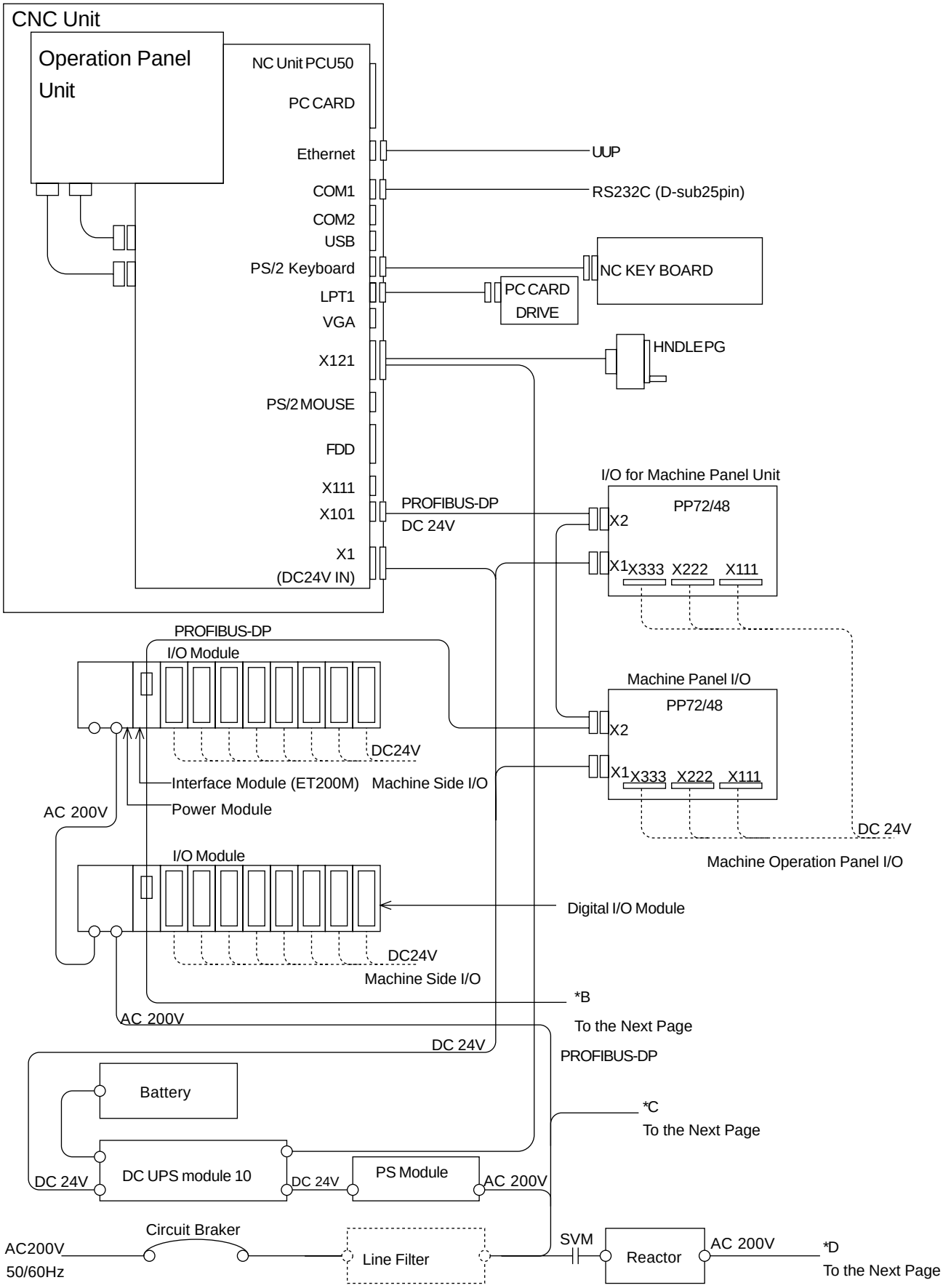


Fig. 1.2(a) Components connection diagram

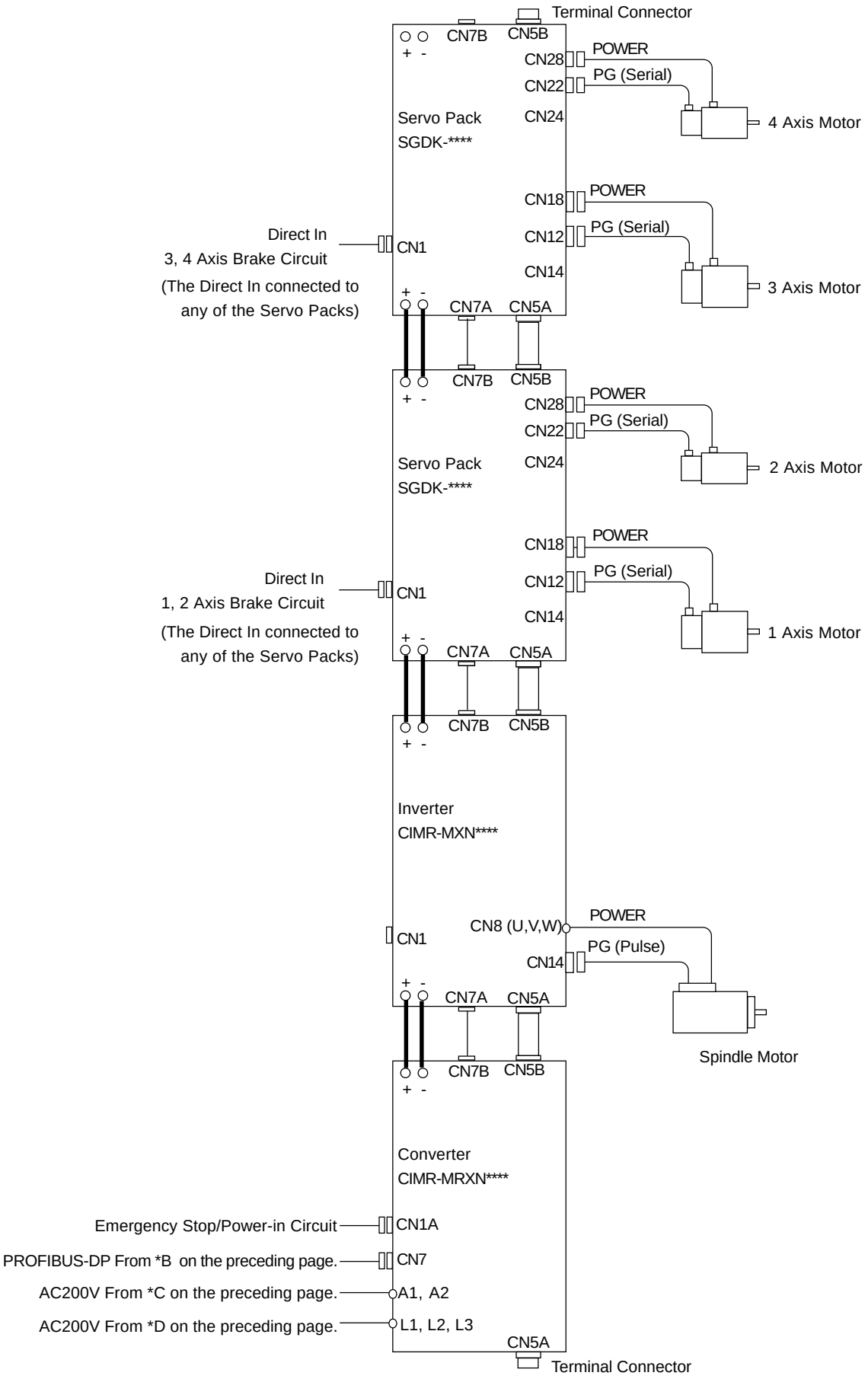


Fig. 1.2(b) Components connection diagram

2. CONTROL UNIT

2.1 PCU50

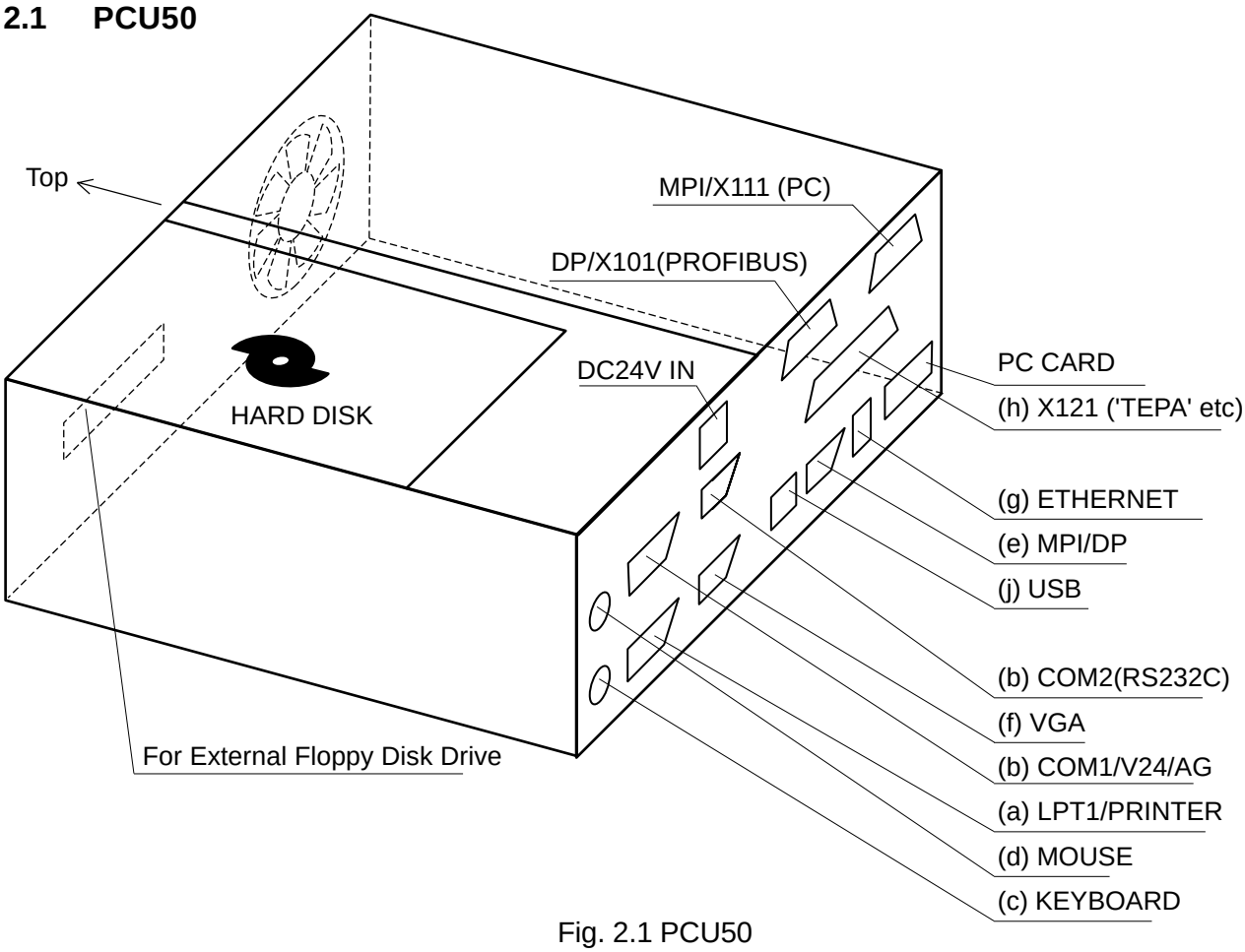


Fig. 2.1 PCU50

2.1.1 Functions

(1) User memory (RAM) Max 256MB
(2) 4.8GB Hard Disk (Replaceable)
(3) WindowsNT operating system
(4) Screen resolution 640 x 480 (VGA)
(5) Power source: DC24V
(6) Interface
  (a) Parallel interface LPT1
  (b) Serial interface 1 x V.24, 1 x V.24/TTY
  (c) PS/2 keyboard interface
  (d) PS/2 mouse interface
  (e) MPI/L2-DP (max 12M baud)
  (f) VGA interface for external monitor
  (g) Ethernet connection 10/100M baud
  (h) 2 slots: 1 x PCI and 1 x common PCI/ISA
  (i) Interface to the operator panel
    • LVDS interface
    • USB interface (internal)
  (j) USB interface

2.1.2 Option

Following options are readily available.

- External floppy disk drive.
- Memory extension up to 256MB.

2.2 MCI Board

2.2.1 Module

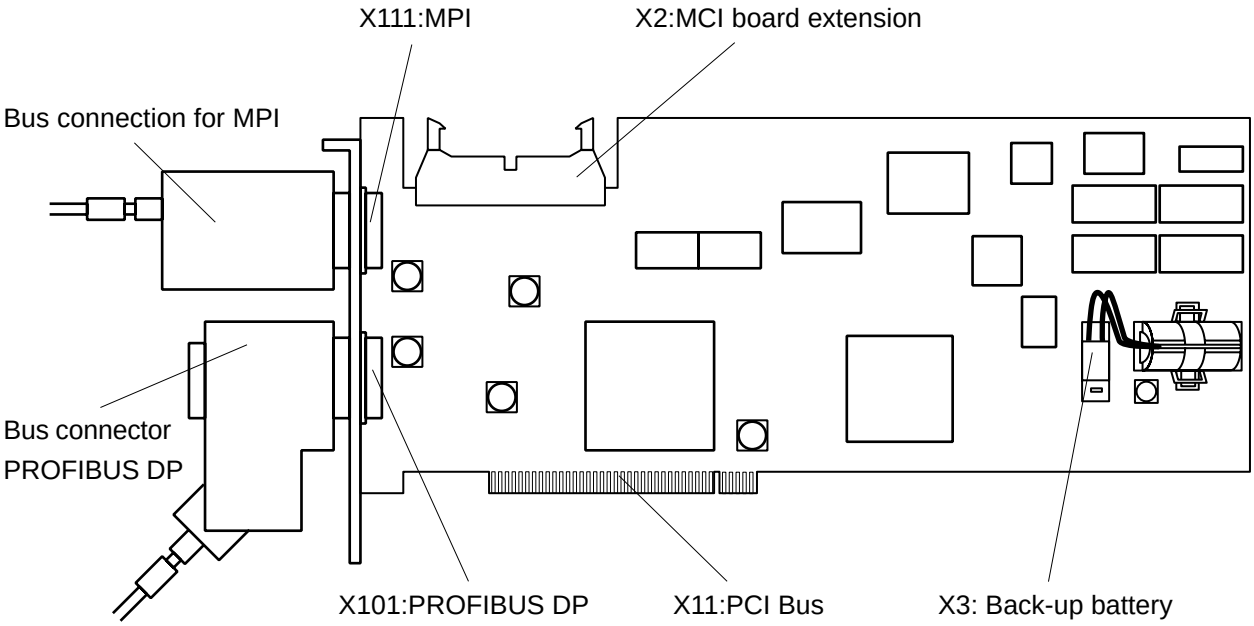


Fig. 2.2.1 MCI Board using Bus Connector

(1) Order number: MCI board

Table 2.2.1(a)

Specification	Order number (MLFB)
MCI board (as spare parts)	6FC5222-0AA00-1AA0

⚠ WARNING

As voltage is always being applied to some parts on the MCI board by the back-up battery, there are cases where the MCI board cannot be installed on the conductive material to avoid a short circuit.

Important

If the MCI board is shipped as spare parts, it is delivered without connecting the battery plug. Therefore, connect the battery plug to the interface X3 before installing the MCI board.

(2) Order number: Bus connector

Table 2.2.1 (b)

Specification	Order number (MLFB)
Bus connector RS485 for PROFIBUS DP and MPI	
180° leader cable 6GK1500-OEA02	
35° leader cable without PG connection socket	6ES7922-0BA40-XA0
35° leader cable with PG connection socket	6ES7922-0BB40-XA0
90° leader cable without PG connection socket	6ES7922-0BA40-XA0
90° leader cable with PG connection socket	6ES7922-0BB40-XA0

(3) Order number: Back-up battery

Table 2.2.1 (c)

Specification	Order number (MLFB)
Back-up battery	6FC5247-0AA18-0AA0

2.2.2 Explanation of Interface

(1) Interface overview

Table 2.2.2(a) Interface of MCI board

Interface specification	Connector specification	Type
FROFIBUS DP	X101	9-pin SUB-D socket
MPI	X111	9-pin SUB-D socket
MCI board	X2	26-pin plug connector
Back-up battery	X3	2-pin plug connector
PCI bus	X11	124-pin edge connector

(2) Pin arrangement

(a) Battery connection X3

Table 2.2.2(b) Pin arrangement of battery connection

Pin	Signal specification	Signal type
1	BATT- (negative pole)	VI
2	BATT+ (positive pole)	VI

Signal type

VI Voltage input

(b) PROFIBUS DP interface X101

Max cable length: 100m at 12M baud

Table 2.2.2(c) Pin arrangement of PROFIBUS DP interface

Pin	Signal specification	Signal type
1	No assignment	-
2	No assignment	-
3	RS-DP (RS485 differential signal)	B
4	RTS (Request to send)	O
5	Gest (Ground, external)	VO
6	P5est (5V power supply)	VO
7	No assignment	-
8	XRS-DP (RS485 differential signal)	B
9	No assignment	-

Signal type

O Output

VO Voltage output

(c) MPI interface X111

Max cable length: 1000m at 1.5Mbaud

Table 2.2.2(d) Pin arrangement of MPI interface

Pin	Signal specification	Signal type
1	No assignment	-
2	No assignment	-
3	RS-MPI (RS485 differential signal)	B
4	RTS (Request to send)	O
5	Gest (Ground, external)	VO
6	P5est (5V power supply)	VO
7	No assignment	-
8	XRS-MPI (RS485 differential signal)	B
9	No assignment	-

Signal type

0 Output

VO Voltage output

2.3 MCI Board Extension

2.3.1 Module

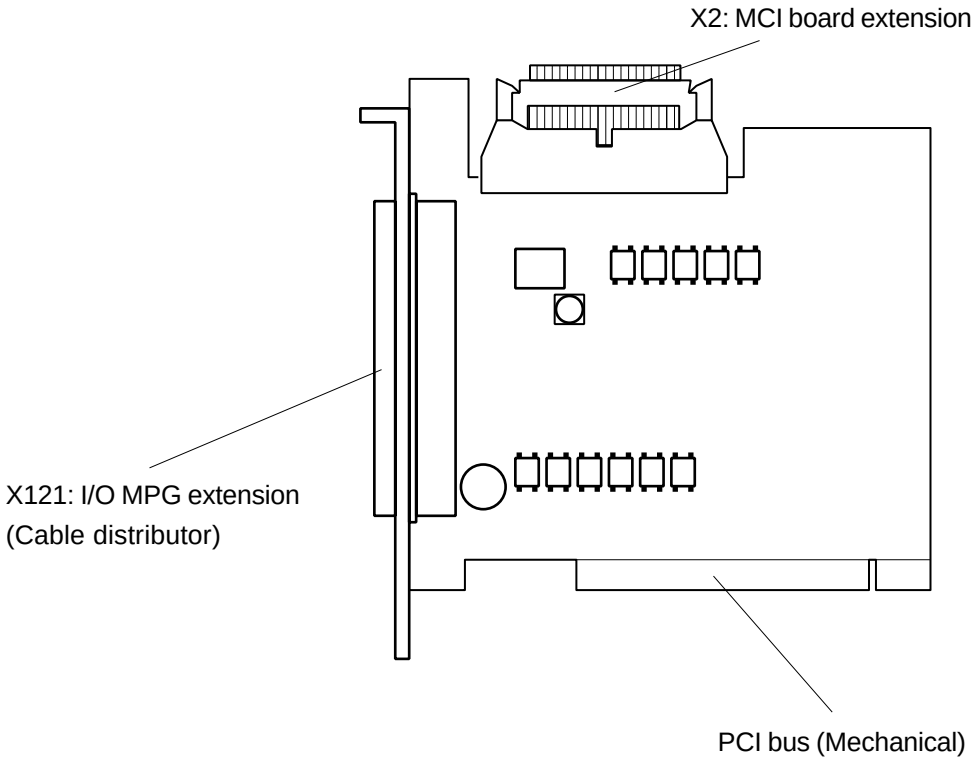


Fig. 2.3.1 Module

(1) Order number

Table 2.3.1

Specification	Order number (MLFB)
MCI board extension (Option)	6FC5222-0AA00-0AA0

CAUTION

Since the cable distributor of MCI board extension interface can be connected and removed only when power is not supplied, connect or remove it after turning off the PCU switch (properly ending WindowsNT). Otherwise, there occurs a short circuit in the MCI board extension module, which may result in the damage of the module.

2.3.2 Explanation of Interface

(1) Interface overview

Table 2.3.2(a) Interface of MCI board

Interface specification	Connector specification	Connector pin type
I/O-MPG extension (Cable distributor)	X 121	37-pin SUB-D socket connector
MCI board extension	X2	26-pin plug connector

(2) Pin arrangement

(a) I/O-MPG extension (Cable distributor) X121

Max cable length: 25m for all functions

Special function: 4 binary input (Floating)
4 binary output (Floating)
2 measurement input (Floating)
2 handles (Without floating)

Table 2.3.2(b) Pin arrangement of connector X121

Pin	Signal specification	Signal type	Pin	Signal specification	Signal type
1	M24EXT	VI	20	P24EXT	VI
2	M24EXT	VI	21	P24EXT	VI
3	OUTPUT1	O	22	OUTPUT3	O
4	OUTPUT0	O	23	OUTPUT2	O
5	INPUT3	I	24	MEXT	VI
6	INPUT2	I	25	MEXT	VI
7	INPUT1	I	26	MEXT	VI
8	INPUT0	I	27	MEXT	VI
9	MEPUS0	I	28	MEPUS1	I
10	MEPUC0	I	29	MEPUC1	I
11	MPGI XA	I	30	MPGI A	I
12	MPGI 5V	VO	31	MPGI 0V	VO
13	MPGI 5V	VO	32	MPGI 0V	VO
14	MPGI XB	I	33	MPGI B	I
15	MPGI XA	I	34	MPGIA	I
16	MPGO 5V	VO	35	MPGO 0V	VO
17	MPGO 5V	VO	36	MPGO 0V	VO
18	MPGO XB	I	37	MPGO B	I
19	No assignment				

Signal specification

MPG0, 15V	15V voltage supply to the handle 0
MPG0, 15V	10V voltage supply to the handle 0
MPG0, 1A, XA	Differential handle input 0, 1A, XA
MPG0, 1B, XB	Differential handle input 0, 1B, XB
MEPUS0, 1	Measurement pulse signal 0, 1
MEPUC0, 1	Measurement pulse common (Ground reference) 0, 1
INPUT[0...3]	Binary NC input 0...3
MEXT	External earth (Ground reference for NC input) 0, 1
OUTPUT[0...3]	Binary NC output 0...3
M24EXT	External 24V supply (-) for binary NC output
P24EXT	External 24V supply (+) for binary NC output

Signal type

O	Output
VO	Voltage output
I	Input
VI	Voltage input

2.4 Hard Disk

2.4.1 Caution on use

The hard disk drive unit equipped to PCU50 is a replaceable part which can separately be ordered as “a hard disk drive with a mounting board and a suction device”. (6FC5247-0AF08-0AA0).

The higher memory density became more sensitive to the vibration or shock during operation or transportation of the new generation hard disk drive unit. Hard conditions of the transportation or machine operation may accelerate wear or breakage of the hard disk drive unit. The shock absorbing suspension of the hard disk is intended to eliminate the damage to the hard disk.

2.4.2 Transportation safety nail

The hard disk unit is shipped with a transportation safety nail locked at its proper position.

The transportation safety nail needs to be locked at its proper position when the machine or machine part including PCU50 is transported. The nail should also be properly hooked when PCU50 is sent back for service.

The packing needs to be the original state or the quality equivalent to the original state.

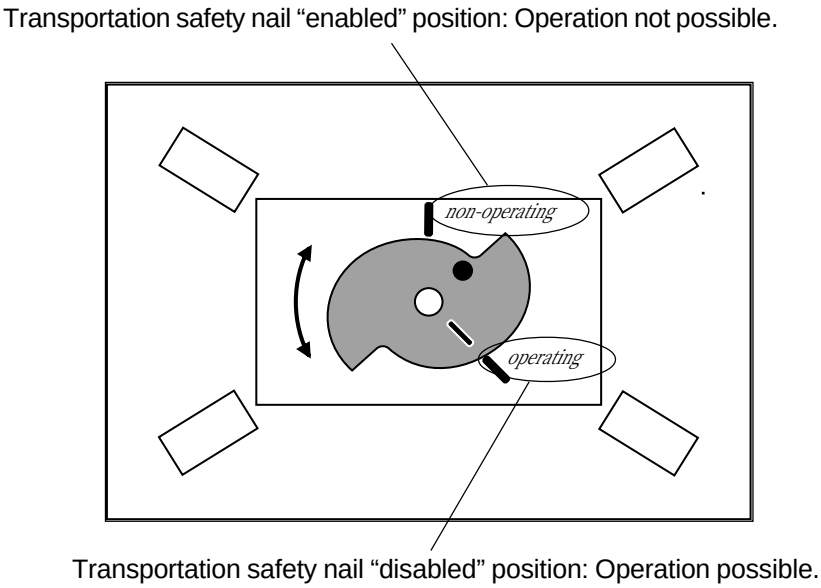


Fig. 2.4.2 Transportation safety device

CAUTION

When changing to another unit, observe the ESD criteria.

2.4.3 Parts removal

① Power turn-off.

② Turn clockwise the handle of the transportation safety nail, setting it at the “Non-operation” position.

③ Remove 4 screws (indicated as A in the figure below) of the unit to be replaced.

④ Open the unit to be replaced. The unit remains open at the suspension.
(Note! Be careful handling the mounting hinge. It is easily removed off the base.)

⑤ Connector X41 (indicated as B below), press in the nails at the both ends of the hard disk drive cable and remove the cable.

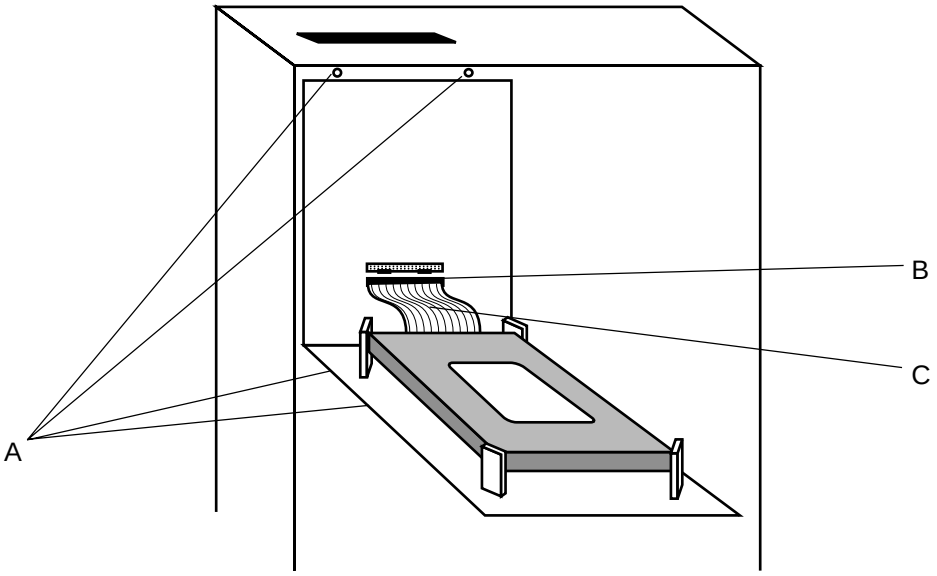


Fig. 2.4.3 Hard disk unit

2.4.4 Replacement unit fixing

① Fix the replacement unit.

② Put the cable from the hard disk into the connector X41 (B in above figure).

③ Make sure the cable is in the proper position (C in above) and close the replacement unit. (Make sure that the cable is always between the hard disk unit and the substrate.)

④ Tightly tighten the 4 screws you removed. (A in above)

⑤ Turn counter-clockwise the handle of the transportation safety nail up to the “Operating” position.

CAUTION

If you boot the control while the transportation safety nail is locked, a message “Operating System not found” appears. Check the position of the transportation safety nail.

2.4.5 Storage

It is recommended to store the unit in the room temperature. If it is not possible, take enough time turning on the power so that the hard disk is not damaged, i.e. there should be waiting time to eliminate the temperature difference between
the storage place and the place the power is turned on.
There should be no dew condensation.

2.4.6 Control cabinet / transportation of the unit

Following conditions are applied the same as the controller without a fixed hard disk.
Shock test: DIN IEC68-2-27 (5g/30ms), Vibration test: DIN IEC68-2-6 (9-500Hz/lg).

3. HOW TO CONNECT PROFIBUS

3.1 Basic Rules of PROFIBUS

Please observe following basic rules.

(1) Terminate the bus at both terminals. To do this, make enable (ON) the terminals of the PROFIBUS DP connectors of the first and last nodes, and make the remaining terminals disable (OFF).

(2) Supply 5V voltage to at least one of the terminals. To do this, connect the PROFIBUS with inserted terminal resistance to the power unit.

(3) First connect each PROFIBUS node, then make it enable (ON). To cut the connection of the node, first make the connection disable (OFF), then remove the connector.

3.2 Example of PROFIBUS Connection

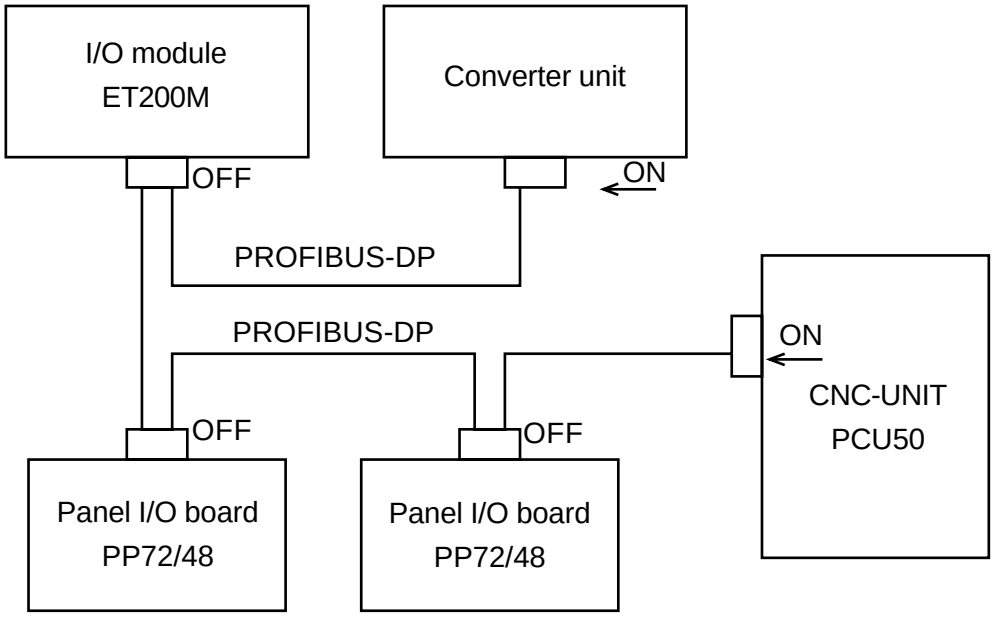


FIg. 3.2 Example of PROFIBUS connection

4. DIAGNOSIS AND MEASURES

If a trouble happens, check "when it happened", "what you were operating", "what it was like" and "how often it happens", etc.

4.1 Tracking through the ALARM Screen

If an alarm happens during operation, an alarm message appears on the top area of the screen.

5. POWER-ON ADJUSTMENT

5.1 Power-on procedures

① Enter (set) the PLC ladder and others.
② Enter (set) the CNC parameters (machine data, setting data).
③ Turn off then turn on again the power.

5.2 Zero point setting for absolute encoder

Note: Before zero point positioning, check the servo drive unit and confirm that the encoder has been reset.
If it is not reset, the drive alarm “A81” appears. In this case, reset the encoder.

Fig. 5.2 Zero point setting screen

5.2.1 Operation procedures

① Move the zero point return axis to zero point of the machine.
② Have the JOG mode (Press the Feed button).
③ Press the [3. Assemble adjustment] in the system menu to have the assemble adjustment screen displayed.
④ Using the cursor, select the axis to set the zero point in the zero point setting screen.
⑤ Press the F6/zero point setting to change the zero point of the machine.

⑥ You are asked [Going to change the zero point of □ axis. OK? Y/N]. Press Y.

⑦ The zero point setting is executed and the coordinate value of the machine turns to 0.

⑧ If the zero setting has not normally been completed, it is an alarm of the PLC side.

5.2.2 Relevant parameters

MD34210 ENC_REFP_STATE Absolute encoder status (2: completed)

6. DAILY MAINTENANCE AND INSPECTION

6.1 Maintenance of Backup Battery

6.1.1 General handling rules

When handling the battery, strictly observe following general rules.

- Do not charge the battery.
- Do not heat the battery or throw it in a fire.
- Do not hole or squash the battery.
- Do not change its mechanical or electrical features.

CAUTION

Inadequate handling of the battery may cause fire, rupture, dangerous flame or explosion.

6.1.2 Battery type

3V-lithium battery

- Order number (MLFB): 6FC5247-0AA18-0AA0

6.1.3 Criteria to change the battery

The 3V lithium battery to back up SRAM and the clock module is monitored at two phases.

Table 6.1.3

Battery voltage	Message
2.7...2.9V	Alarm: "2100NCK -battery reached the warning threshold."
2.4...2.6V	Alarm: "2101-NCK battery alarm" Alarm: "2102-NCK battery alarm"

The alarm "2101-NCK battery alarm" occurs if shortage of battery voltage is detected during periodic operation.

The alarm "2102-NCK battery alarm" occurs if shortage of battery voltage is detected during booting.

6.1.4 Battery Replacement

After the alarm "2100NCK-Battery reached the warning threshold" has occurred or when "210xNCK battery alarm" has first occurred, replace the battery of the MPI board.

⚠ WARNING

When operating electrical units, dangerous level voltage is inevitably being applied to some of these units. If the units are not properly maintained, it may cause a death accident, a serious injury accident or a damage to the material. When maintaining the units, observe all of the instructions described in this manual and on the unit itself.

- Only qualified staff can do the maintenance.
- Before executing the maintenance and repair, cut the connection of the unit off the main cable.
- Only use spare parts permitted to use.
- Strictly observe the interval of maintenance and the instructions on repair and replacement.

⚠ WARNING

The module contains statically sensitive components. Before touching the electrical module, the person working has to discharge his own static. The easiest way to do this is to touch a conductive ground object (such as the bare metal area of the switchboard or the plug switch protection conductor).

Replace the battery with following procedures.

(1) Turn off the NC power.
(2) Open the PC housing following appropriate safety rules.
(3) Loosen the mutual connection cable to the MCI board extension module and interface X2.
(4) Loosen the mounting screws on the cover plate of the module.
(5) Remove the module.
(6) Open the battery clip using an appropriate screw driver.
(7) Remove the cable connection X3 (battery connector) from the module.

(8) Take out the old battery and dispose of it following applicable regulations.

(9) Insert a new battery and connect the battery connector to the terminal contact without applying force (X3).

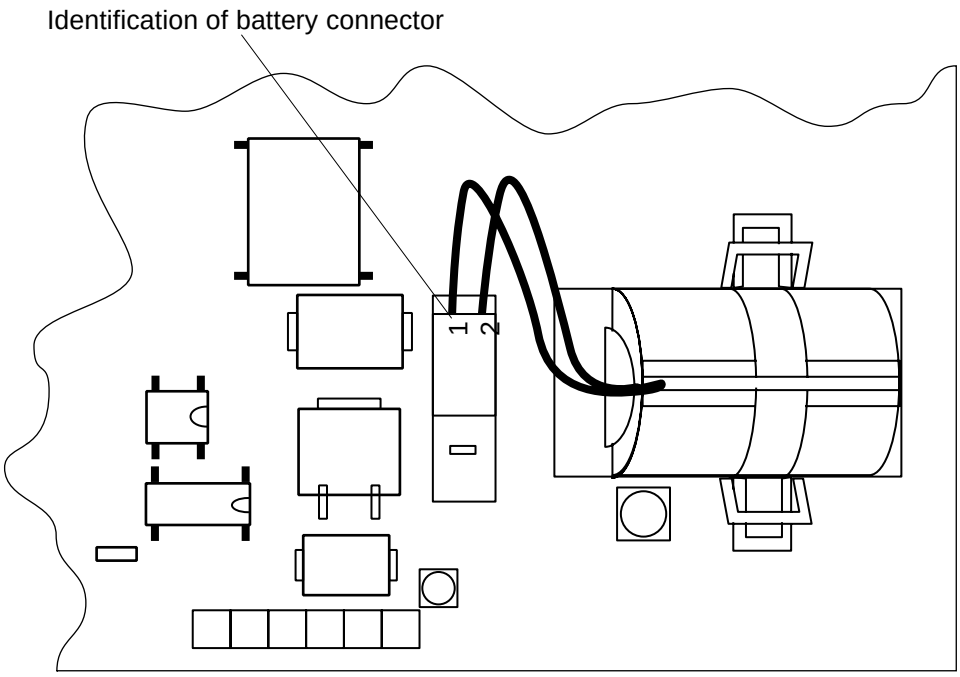


Fig. 6.1.4 Battery connector

(10) Fix the battery clip to the module.
(Note) When the clip if properly fixed, it clicks.

(11) Connect the module to the mother board and fix it to the cover plate with the mounting screws.

(12) Close the PC housing.

(13) Turn on the NC power source.

6.2 Maintenance of UPS battery

When the PLC alarm "700048 UPS battery life is over. Change the battery" appears, change the battery early.

II. ALARM LIST

Alarms are classified as follows.

1. NCK ALARMS

   000000 to 009999 General alarms
   010000 to 019999 Channel alarms
   020000 to 029999 Axis/spindle alarms
   030000 to 059999 Functional alarms
   060000 to 064999 Cycle alarms (Standard)
   065000 to 069999 Cycle alarm (User)
   070000 to 079999 Compile cycle alarm

2. MMC ALARMS

   100000 to 100999 Basic system
   101000 to 101999 Diagnostics
   102000 to 102999 Services
   103000 to 103999 Machine
   104000 to 104999 Parameter
   105000 to 105999 Programming
   106000 to 106999 Spare
   107000 to 107999 OEM
   110000 to 110999 MMC 100 messages
   120000 to 120999 MMC 102/103 messages

3. DRIVE ALARMS

   300000 to 399999

4. PLC ALARMS

   400000 to 499999 General alarms
   500000 to 599999 Channel alarms
   600000 to 699999 Axis/spindle alarms
   700000 to 799999 User area
   800000 to 899999 Sequencers/graphs
   810001 to 810009 System error messages from PLC

5. GLOSSARY/ABBREVIATIONS

1. NCK ALARMS

1.1 General Alarms

1000	System error《System error number》
1001	System error《System error number》.
1002	System error《System error number》.
1003	Self-clearing alarm. Alarm pointer of《Incorrect system error number》is 0.
1004	Alarm reaction to NCK alarm incorrectly projected.
1005	OS system error《Operating system error number》Parameter《Operating system error parameter1》《Operating system error parameter 2》《Operating system error parameter 3》.
1010	System error《System error number》《Action number/action name》<ALNX> (Ch《Channel number》).
1011	Channel《Channel number》《Option parameter: block number, label》《Option parameter: block number, label》System error《System error number》.
1012	System error《System error number》. (Ch《Channel number》)
1013	System error《System error number》. (Ch《Channel number》)
1014	System error《System error number》. (Ch《Channel number》)
1015	Axis《Axis number》System error《System error number》Occurred! (Ch《Channel number》)
1016	Axis《Axis number》System error《System error number》Occurred! (Ch《Channel number》)
1017	Axis《Axis number》System error《System error number》Occurred! (Ch《Channel number》)
1018	Floating point arithmetic error Channel《Channel number》Task《Task ID》Station《Station priority》FPU state《FPU state》.
1019	Floating point arithmetic error Address《Protection area number》《Code address of operation that triggered the error》Channel《Channel number》Task《Task ID》FPU state《FPU state》.
1030	System error in link module. Error code《Hexadecimal number link error》Error type《Hexadecimal number link error type》.
1031	Link module error Specification《Hexadecimal number unspecified status in state0fLinkModules》None. NCU:《NCU number》《Command from link module to NCK》《Status of own link》.
1160	Assertion failed in《String (path with program name)》: Line《String (line number)》.
2000	Signal in life monitoring: PLC not alive.
2001	PLC has not started up.
2100	NCK battery warning threshold reached.
2101	NCK battery alarm.
2102	NCK battery alarm.
2110	NCK temperature alarm.
2120	NCK fan alarm.
2130	Measurement circuit or D/A converter poser supply failure.
2140	Current service switch position clears SRAM when power is turned on next. (Overall reset valid)
2190	Hardware plug-in module for communication with the digitizer missing.
2192	NCU link module cannot be used. MD《String (machine data identifier)》reset.
3000	Emergency stop.
3001	Internal emergency stop.

4000	Machine data《String: Machine data identifier》[《Index: Machine data array index》] has gap in axis assignment. (Ch《Channel number》)
4001	Axis《Index: Machine axis number》 Defined for more than one channel via machine. (Ch《Channel number 》)
4002	Machine data《String: Machine data identifier》[《Index: Machine data array index》] assigns an axis not defined in channel. (Ch《Channel number》)
4003	Axis《Axis number》 Assignment of master channel in machine data《String: Machine data identifier》 incorrect or missing.
4010	Invalid ID used in machine data《String: Machine data identifier》[《Index: Machine data array index》].
4011	Invalid ID used in machine data《String: Machine data identifier》[《Index: Machine data array index》]. (Ch《Channel number》)
4012	Invalid ID used in machine data《String: Machine data identifier》[《Index: Machine data array index》].
4013	Invalid NCU link projection by NCU_1 machine data《String: Machine data identifier》 = 《Index: Machine data array index》.
4014	Axis《String: Name of identifier》 used several times in《String: Machine data identifier》
4016	Axis《Machine axis index》 already used by NCU《NCU number》.
4017	Axis container《Axis container number》, location《Axis container location》 already used by NCU《NCU number》.
4018	Axis container《Axis container number》, location《Axis container location》 not used by any channel.
4019	Axis container《NCU number》 NCU《Axis container number》: Switch of axis container《NCU number》 is not used in the current status of《%3》.
4020	Identifier《String: Name of identifier》 used several times in machine data《String: Machine data identifier》.
4021	Channel《Channel number》 ID《String: Name of identifier》 used several times in machine data《Machine data identifier》.
4024	Axis configuration MD《NCU number》[《Axis container number》] miss.
4026	Machine data《String: Machine data identifier》[《Index: Machine data array index》], Link axis NC《NCU number》_AX《Machine axis number》 not used by any channel.
4030	Incorrect axis ID in machine data《String: Machine data identifier》[《Index: Machine data array index》]. (Ch《Channel number》)
4032	Wrong ID for facing axis in《String: Machine data identifier》. (Ch《Channel number》)
4040	Channel《Channel number》 Axis ID《String: Axis identifier》 not consistent with machine data《String: Machine data identifier》.
4050	NC cade ID《String: Old identifier》 cannot be reconfigured to《String: New identifier》.
4060	Standard machine data loaded.
4062	Backup data loaded.
4065	Buffered memory was restored from disk file (possible data loss!).
4070	Normalizing machine data has been altered.
4075	Machine data《String: Machine data identifier》 (and maybe others) not altered - permission level《Write protection level of MD》 needed.

4076	《Machine data number》 Machine data could not be altered with access level《Preset access authorization level》.
4077	New value《Machine data number》of machine data《New value of machine data》 not set. Requested《Number of bytes requested that exceeded availability》 bytes too much《Type of memory》 memory.
4080	Incorrect configuration of indexing axis in machine data《String: Machine data identifier》.
4100	System cycle time corrected for digital drive.
4101	Position control cycle for digital drive reduced to《String: Time (ms)》 ms.
4110	IPO cycle factor increased to《String: New IPO cycle time》.
4111	PLC cycle increased to《String: New PLC cycle time》 ms.
4200	Geometry axis《Axis name》 must not be declared a rotary axis. (Ch《Channel number》)
4210	Spindle《Axis name, spindle number》declaration as rotary axis missing. (Ch《Channel number》)
4215	Spindle《Axis name, spindle number》 declaration as module axis missing. (Ch《Channel number》)
4220	Spindle《Axis name, spindle number》 declared repeatedly. (Ch《Channel number》)
4225	Axis《Axis name, axis number》 declaration as rotary axis missing. (Ch《Channel number》)
4230	Data alteration from external not possible in current channel state. (Ch《Channel number》)
4240	Runtime overflow for IPO cycle or position controller cycle, IP《Channel number》.
4270	Machine data《String: Machine data identifier》 assigns not activated NCK input/output byte no.《Index》.
4275	Machine data《String: Machine data identifier》 and《String: Mahine data identifier》 both assign the same NCK output byte no.《No. of output》.
4280	Assignment of NCK-input/output byte via《String: Machine data identifier》 [《String: Machine data array index》] does not match hardware configuration.
4282	Hardware of external NCK output assigned repeatedly.
4285	Error on terminal block《Number of terminal block》 error, error code《Error code》.
4290	Sign-of-life monitoring: local P-bus not alive.
4291	Failure of module in local P-bus slot《Slot number》, error code《Error code》《Error code》《Error code》.
4300	Declaration in machine data《String: Machine data identifier》 is not allowed for geometry axis/ spindle《Axis name, spindle number》.
4310	Declaration in machine data《String: Machine data identifier》 index《Index in machine data array》 is not allowed.
4340	Invalid transformation type in transformation no.《Transformation number》. (Ch《Channel number》)
4345	Invalid configuration in chained transformation no.《Transformation number》. (Ch《Channel number》)
4350	Channel《Channel number》Axis identifier《String: Axis identifier》 machine data《String: Machine data identifier》 not consistent with machine data《String: Machine data identifier》.
4400	Machine data alteration will cause reorganization of buffered memory (loss of data!).
4502	《String: Machine data identifier》 (《String: Machine data identifier》) invalid,《Machine data identifier》 change. (Ch《Channel number》)
5000	Communication job not executed.

6000	Memory reorganized using standard machine data.
6010	Data module《String: Block number》does not exist or is not completely created, error code《Internal error code》. (Ch《Channel number》)
6020	Machine data have been altered - now memory is reorganized.
6030	Limit of user memory has been adapted.
6401	Tool not changed. No empty location for tool《String (identifier)》Duplo no.《Duplo number》on magazine《Magazine number》 (Ch《Channel number》)
6402	Tool not changed. Magazine no.《Magazine number》not available. (Ch《Channel number》)
6403	Tool not changed. Magazine location《Magazine number》on magazine no.《Magazine location number》not available. (Ch《Channel number》)
6404	Tool not changed. Tool《Identifier》not available or missing. (Ch《Channel number》)
6405	Command《Command number》has invalid PLC acknowledge. (Parameter《PLC acknowledge parameter》- id=《Error identifier》) (Ch《Channel number》)
6406	PLC acknowledge for command《Command number》is missing. (Ch《Channel number》)
6407	Tool《String (identifier)》cannot be placed in the magazine《Magazine number》on location《Magazine location number》. Invalid definition of magazine! (Ch《Channel number》)
6410	Unit《TO unit》tool《Tool identifier (name)》with duplo number《Duplo number》has come close to life-time.
6411	Tool《Tool identifier》with duplo number《Duplo number》has reached tool monitor warning limit. (Ch《Channel number》)
6412	Unit《TO unit》tool《Tool identifier (name)》with duplo number《Duplo number》has reached life-time.
6413	Tool《Tool identifier (name)》with duplo number《Duplo number》has reached tool monitor limit. (Ch《Channel number》)
6421	Tool not moved. Empty location for tool《String (identifier)》Duplo number《Duplo number》on magazine《Magazine number》not available. (Ch《Channel number》)
6422	Tool not moved. Magazine《Magazine number》not available. (Ch《Channel number》)
6423	Tool not moved. Location《Location number》on magazine《Magazine number》not available. (Ch《Channel number》)
6424	Tool not moved. Tool《String (identifier)》not available or not specified. (Ch《Channel number》)
6425	Tool《String (identifier)》cannot be placed in the magazine《Magazine number》on location《Location number》. Invalid definition of magazine! (Ch《Channel number》)
6430	Workpiece conter: overflow in table of monitored cutting edge.
6431	Function not allowed. Tool management/monitoring is not active.
6432	Function not allowed. No tool assigned to spindle.
6500 6510	NC memory is full. Too many files in the NC memory.
6520	Too many protocol files in the NC memory.
6530	Too many files in directory.
6540	Too many directories in the NC memory.
6550	Too many subdirectories.
6560	Data format not allowed.
6600	NC card memory is full.
6610	Too many open files on NC card

6620	NC card has incorrect format.
6630	NC card hardware is defective.
6640	NC card is not inserted.
6650	Write protection of NC card is active.
6660	'Flash File System' option is not set.
6698	Unknown NC card (《%1》/《%2》). Cannot write.
7000	Too many compile cycle alarms defined.
7010	Range of MMC alarm numbers for compile cycles exceeded.
7020	Compile cycle alarm number has not been defined.
7100	VDI area of《String (machine data)》input and《String (machine data)》output bytes defined by compile cycles exceeds《Max length for interface》.
8000	Option 'user interrupt programs' not set. (Ch《Channel number》)
8010	Option 'activation of more than《Number of axis》axes' not set.
8020	Option 'activation of more than《Number of channels》channels' not set.
8021	Option 'activation of more than《Number of mode group》mode groups' not set.
8022	Option 'activation of more than《Memory size》kb SRAM' not set.
8030	Option 'interpolation of more than 4 axes' not set. (Ch《Channel number》《Block number》)
8032	Option 'activation of more than《Number of axes》link axes" not set.
8034	Option 'activation of axis containers' not set.
8040	Machine data《String: Machine data identifier》reset, corresponding option is not set.
8041	Axis《Axis number》: Machine data《String: Machine data identifier》deleted. Corresponding option not sufficient.
8098	Invalid combination of options (《Bit mask of options》).
8100	Function not possible. (Ch《Channel number》《Block number, label》)

1.2 Channel Alarm

10200	NC Start with active alarm not allowed. (Ch《Channel number》)
10202	NC Start not possible. (Ch《Channel number》)
10203	NC Start without reference point. (Action =《Action number》 <ALNX>) (Ch《Channel number》)
10204	General error. (Ch《Channel number》)
10205	Internal error in《String》. (Ch《Channel number》)
10206	General error in function generator. (Ch《Channel number》)
10207	Error when selecting or deselecting the digitize function. (Ch《Channel number》)
10208	Continue program with NC Start. (Ch《Channel number》)
10209	Internal NC Stop after block search. (Ch《Channel number》)
10220	Active. (Ch《Channel number》)
10221	Not stopped at end of block. (Ch《Channel number》)
10222	Inter-channel communication not possible. (Ch《Channel number》)
10223	No.《Channel number》 channel command《String》 is already active.
10224	No.《Channel number》 channel command is denied.
10225	No.《Channel number》 channel command《Command》 is refused.
10226	No.《Channel number》 channel reset is aborted.
10227	No.《Channel number》 channel command is aborted.
10230	Mode group《Mode group number》 Channel《Channel number》: Program interruption does not permit mode change.
10231	Mode group《Mode group number》 Channel《Channel number》: Program stop does not permit mode change
10232	Mode group《Mode group number》 Channel《Channel number》: does not permit mode change.
10240	Mode group《Mode group number》 Channel《Channel number》: Mode change not possible.
10241	Mode group《Mode group number》 Channel《Channel number》: Mode change in active channel not possible.
10242	Mode group《Mode group number》 Channel《Channel number》: Mode change in active channel not possible at this time.
10243	Mode group《Mode group number》 cannot change mode. (Ch《Channel number》)
10249	Mode group《Mode group number》 Channel《Channel number》: Mode change command canceled.
10250	Reorganization of block processing not possible at this time. (Ch《Channel number》)
10251	No.《Channel number》 channel.
10252	Reorganization sequence canceled. (Ch《Channel number》)
10253	Reorganization sequence canceled. (Ch《Channel number》)
10252	Reorganization sequence canceled. (Ch《Channel number》)
10253	Reorganization sequence canceled. (Ch《Channel number》)
10254	Reorganization sequence canceled. (Ch《Channel number》)
10255	Reorganization sequence canceled. (Ch《Channel number》)
10256	Reorganization sequence canceled. (Ch《Channel number》)
10257	Reorganization sequence canceled. (Ch《Channel number》)
10258	Mode group《Mode group number》 Channel《Channel number》: ID invalid or duplicated.

10259	No.《Channel number》channel.
10260	No.《Channel number》channel.
10600	Auxiliary function during thread cutting is active. (Ch《Channel number》《Block number, label》)
10601	Zero velocity at block end point during thread cutting. (Ch《Channel number》《Block number, label》)
10602	Velocity limitation during thread cutting. (Ch《Channel number》《Block number》)
10610	Axis《Axis name, spindle number》not supported. (Ch《Channel number》)
10620	Axis《Axis name, spindle number》at software limit switch《String》. (Ch《Channel number》《Block number, label》)
10621	Axis《Axis name, spindle number》rests on software limit switch《String》. (Ch《Channel number》)
10630	Axis《Axis name, spindle number》at working area limit《String (+ or -)》. (Ch《Channel number》《Block number, label》)
10631	Axis《Axis name, spindle number》rests at working area limit《String《+ or -》》. (Ch《Channel number》)
10640	Spindle《Spindle number》cannot stop during gear change. (Ch《Channel number》《Block number》)
10650	Axis《Axis name》incorrect gantry machine data. Error code《Error number》 (Ch《Channel number》)
10651	Illegal gantry configuration. Error code《Error number》. (Ch《Channel number》)
10652	Axis《Axis name》gantry warning threshold exceeded. (Ch《Channel number》)
10653	Axis《Axis name》gantry error threshold exceeded. (Ch《Channel number》)
10654	Waiting for synchronization start of gantry group《Gantry group number》. (Ch《Channel number》)
10655	Synchronization of gantry group《Gantry group number》in progress. (Ch《Channel number》)
10656	Axis《Axis name》gantry alarm not yet used. (Ch《Channel number》)
10700	Global protection zone《Protection zone number》violated during automatic or MDI mode. (Ch《Channel number》《Block number》)
10701	Channel-specific protection zone《Protection zone number》violated during automatic or MDI mode. (Ch《Channel number》《Block number》)
10702	Global protection zone《Protection zone number》violated during manual mode. (Ch《Channel number》)
10703	Channel-specific protection zone《Protection zone number》violated during manual mode. (Ch《Channel number》)
10704	Protection zone is not guaranteed. (Ch《Channel number》《Block number》)
10706	Global protection zone《Protection zone number》reached with axis《Axis name》during manual mode. (Ch《Channel number》)
10707	Channel-specific protection zone《Protection zone number》reached with axis《Axis name》during manual mode. (Ch《Channel number》)
10710	Conflict with centerless grinding. (Ch《Channel number》《Spindle number》)
10720	Axis《Axis name, spindle number》software limit switch《String (+ or -)》. (Ch《Channel number》《Block number, label》)
10730	Axis《Axis name, spindle number》working area limitation《String (+ or -)》. (Ch《Channel number》《Block number, label》)

10740	Too many dummy blocks of smooth approach/retraction. (Ch《Channel number》《Block number, label》)
10741	Direction reversal with smooth approach/retraction. (Ch《Channel number》《Block number, label》)
10742	Parameter DISR invalid or not present. (Ch《Channel number》《Block number, label》)
10743	Too many smooth approach/retraction. (Ch《Channel number》《Block number, label》)
10744	Direction defined for smooth approach/retraction is invalid. (Ch《Channel number》《Block number, label》)
10745	End position for smooth approach/retraction not clear. (Ch《Channel number》《Block number, label》)
10746	Block search stop at smooth approach/retraction. (Ch《Channel number》《Block number, label》)
10747	Smooth retraction direction not defined. (Ch《Channel number》《Block number, label》)
10750	Tool radius compensation activated without tool no. (Ch《Channel number》《Block number, label》)
10751	Danger of collision due to tool radius compensation. (Ch《Channel number》《Block number, label》)
10752	Overflow of local block buffer with tool radius compensation. (Ch《Channel number》《Block number, label》)
10753	Activate tool radius compensation in linear block only. (Ch《Channel number》《Block number, label》)
10754	Deactivate tool radius compensation in linear block only. (Ch《Channel number》《Block number, label》)
10755	Do not activate tool radius compensation via KONT at the current starting point. (Ch《Channel number》《Block number, label》)
10756	Do not activate tool radius compensation via KONT at the programmed end point. (Ch《Channel number》《Block number, label》)
10757	Do not change the compensation plane while tool radius compensation is active. (Ch《Channel number》《Block number, label》)
10758	Curvature radius with variable compensation value too small. (Ch《Channel number》《Block number, label》)
10759	Path is parallel to tool orientation. (Ch《Channel number》《Block number, label》)
10760	Helical axis is not parallel to tool orientation. (Ch《Channel number》《Block number, label》)
10761	Tool radius compensation for ellipse with more than one revolution not possible. (Ch《Channel number》《Block number, label》)
10762	Too many empty blocks between two traversing blocks with active tool radius compensation. (Ch《Channel number》《Block number, label》)
10763	Path component of the block in the compensation plane becomes zero. (Ch《Channel number》《Block number, label》)
10764	Discontinuous path with active tool radius compensation. (Ch《Channel number》《Block number, label》)
10765	3D tool radius compensation not possible. (Ch《Channel number》《Block number, label》)
10766	Illegal change of surface orientation between block《Block number, label》 and block《Block number, label》. (Ch《Channel number》)

10767	Processing with tilt angle unequal 0 not possible. (Ch《Channel number》《Block number, label》)
10768	Illegal tool orientation with 3D-cutter compensation. (Ch《Channel number》《Block number, label》)
10769	Illegal surface normal vector with 3D-cutter compensation. (Ch《Channel number》《Block number, label》)
10770	Change of corner type due to change of orientation with active tool radius compensation. (Ch《Channel number》《Block number, label》)
10771	Overflow of local block buffer due to orientation smoothing. (Ch《Channel number》《Block number, label》)
10772	Illegal orientation change when activating or deactivating 3D face cutting. (Ch《Channel number》《Block number, label》)
10773	Illegal tool orientation in block《Block number, label》 at inside corner with block《Block number, label》. (Ch《Channel number》)
10774	Illegal tool dimensions with face cutting in block《Block number, label》. (Ch《Channel number》)
10775	Illegal tool change with face cutting in block《Block number, label》. (Ch《Channel number》)
10776	Axis《Axis name》 must be geo axis if cutter compensation is active. (Ch《Channel number》《Block number, label》)
10777	Tool radius compensation: too many blocks with suppression of compensation. (Ch《Channel number》《Block number, label》)
10778	Preparation stop with active tool radius compensation. (Ch《Channel number》《Block number, label》)
10779	Tool in tool point direction for 3-D circumference milling. (Ch《Channel number》《Block number, label》)
10780	Tool to compensate tool radius is not allowed to be changed. (Ch《Channel number》《Block number, label》)
10790	Plane change during linear programming with angles. (Ch《Channel number》《Block number, label》)
10791	Invalid angle during linear programming. (Ch《Channel number》《Block number, label》)
10792	Illegal interpolation type during linear programming with angles. (Ch《Channel number》《Block number, label》)
10793	Second block missing during linear interpolation with angles. (Ch《Channel number》《Block number, label》)
10794	Angle missing from second block during linear interpolation with angles. (Ch《Channel number》《Block number, label》)
10795	End point parameter conflict during angle programming. (Ch《Channel number》《Block number, label》)
10800	Axis《Axis name, spindle number》 is not a geometry axis. (Ch《Channel number》《Block number, label》)
10805	Repositioning after switch of geometry axes or transformation. (Ch《Channel number》《Block number, label》)
10810	Master spindle not defined. (Ch《Channel number》《Block number, label》)
10820	Rotary axis/spindle《Axis name, spindle number》 not defined. (Ch《Channel number》)

10860	Feedrate not programmed. (Ch《Channel number》《Block number, label》)
10861	Channel《Channel number》block《Block number, label》velocity of positioning axis <<Axis name, spindle number>> is zero.
10862	Master spindle is axis of path. (Ch《Channel number》《Block number, label》)
10870	Facing axis not defined. (Ch《Channel number》《Block number, label》)
10880	Too many empty blocks between two traversing blocks when inserting chamfer or radius. (Ch《Channel number》《Block number, label》)
10881	Overflow of local block buffer when inserting chamfer or radius. (Ch《Channel number》《Block number, label》)
10882	Do not activate chamfer or radius without traversing. (Ch《Channel number》《Block number, label》)
10890	Overflow of local block buffer when calculating splines. (Ch《Channel number》《Block number, label》)
10891	Multiplicity of node is greater than its order. (Ch《Channel number》《Block number, label》)
10900	No S value programmed for constant cutting speed. (Ch《Channel number》《Block number, label》)
10910	Excessive velocity of one path axis. (Ch《Channel number》《Block number, label》)
10911	Transformation prohibits to traverse the pole. (Ch《Channel number》《Block number, label》)
10912	Preparation and interpolation might not be synchronized. (Ch《Channel number》《Block number, label》)
10913	Negative feed profile is omitted. (Ch《Channel number》《Block number, label》)
10914	Movement not possible while transformation active - in channel《Channel number》for block《Block number, label》.
10930	Interpolation type not allowed in stock removal contour. (Ch《Channel number》《Block number, label》)
10931	Error in programmed stock removal contour. (Ch《Channel number》《Block number, label》)
10932	Preparation of contour has been restarted. (Ch《Channel number》《Block number, label》)
10933	Contour program contains too few contour blocks. (Ch《Channel number》《Block number, label》)
10934	Array for contour segmentation is set too small. (Ch《Channel number》《Block number, label》)
10940	Curve table《Number of curve table》cannot be deleted/overwritten. (Ch《Channel number》《Block number, label》)
10941	Curve table《Number of curve table》NC memory full. (Ch《Channel number》《Block number, label》)
10942	Curve table《Number of curve table》illegal instruction on defining. (Ch《Channel number》《Block number, label》)
10943	Curve table《Number of curve table》direction change of lead value in the block not allowed. (Ch《Channel number》《Block number, label》)
10944	Curve table《Number of curve table》: illegal transformation. (Ch《Channel number》《Block number, label》)
10945	Curve table《Number of curve table》: illegal coupling of axes. (Ch《Channel number》《Block number, label》)
10946	Curve table《Number of curve table》: no contour defined. (Ch《Channel number》《Block number, label》)

10947	Curve table《Number of curve table》: contour not continuous. (Ch《Channel number》《Block number, label》)
10948	Curve table《Number of curve table》: position jump at end of period. (Ch《Channel number》《Block number, label》)
10949	Curve table《Number of curve table》: missing leading axis movement. (Ch《Channel number》《Block number, label》)
12000	Address《Source string of the address》programmed repeatedly. (Ch《Channel number》《Block number, label》)
12010	Address《Source string of the address》address type programmed too often. (Ch《Channel number》《Block number, label》)
12020	Combination of address modification not allowed. (Ch《Channel number》《Block number, label》)
12030	Invalid arguments or data types in《Source string》. (Ch《Channel number》《Block number, label》)
12040	Expression《Source string of the address》is not of data type 'AXIS'. (Ch《Channel number》《Block number, label》)
12050	Digital input/comparator《DIN address in the source text block》is not configured. (Ch《Channel number》《Block number, label》)
12060	Same G group programmed repeatedly. (Ch《Channel number》《Block number, label》)
12070	Too many syntax-defining G functions. (Ch《Channel number》《Block number, label》)
12080	Syntax error in text《Source text area》. (Ch《Channel number》《Block number, label》)
12090	Unexpected argument《Disallowed parameters in the text》. (Ch《Channel number》《Block number, label》)
12100	Number of passes《Number of passes》not permissible. (Ch《Channel number》《Block number, label》)
12110	Syntax cannot be interpreted. (Ch《Channel number》《Block number, label》)
12120	Write special G function in separate block. (Ch《Channel number》《Block number, label》)
12130	Tool orientation not permissible. (Ch《Channel number》《Block number, label》)
12140	Expression《Functions in the source text》not contained in this release. (Ch《Channel number》《Block number, label》)
12150	Operation《String (violating operator)》not compatible with data type. (Ch《Channel number》《Block number, label》)
12160	Range of values exceeded. (Ch《Channel number》《Block number, label》)
12170	Identifier《Symbol in block》defined repeatedly. (Ch《Channel number》《Block number, label》)
12180	Illegal chaining of operators《Chained operators》. (Ch《Channel number》《Block number, label》)
12190	Variable of type ARRAY too many dimensions. (Ch《Channel number》《Block number, label》)
12200	Symbol《Symbol in the source program》cannot be created. (Ch《Channel number》《Block number, label》)
12210	String《String in the source block》too long. (Ch《Channel number》《Block number, label》)
12220	Binary constant《Binary constant》in string too long. (Ch《Channel number》《Block number, label》)
12230	Hexadecimal constant《Hexadecimal constant》in string too long. (Ch《Channel number》《Block number, label》)

12240	Tool orientation《Text》defined repeatedly. (Ch《Channel number》《Block number, label》)
12250	Do not next macro《Source string》. (Ch《Channel number》《Block number, label》)
12260	Too many initialization values given for《Source string》. (Ch《Channel number》《Block number, label》)
12261	Initialization not allowed of《Source string》. (Ch《Channel number》《Block number, label》)
12270	Macro identifier《Source string (macro name)》already defined. (Ch《Channel number》《Block number, label》)
12280	Maximum macro length《Source string》exceeded. (Ch《Channel number》《Block number, label》)
12290	Arithmetic variable《Source string (arithmetic variable)》not defined. (Ch《Channel number》《Block number, label》)
12300	Call-by-reference argument missing on subroutine call《Source string》. (Ch《Channel number》《Block number, label》)
12310	Axis argument missing on procedure call《Source string》. (Ch《Channel number》《Block number, label》)
12320	Argument《Source string》must be call-by-reference. (Ch《Channel number》《Block number, label》)
12330	Type of argument《Source string》incorrect. (Ch《Channel number》《Block number, label》)
12340	Number of argument exceeded in《Source string》. (Ch《Channel number》《Block number, label》)
12350	Argument《Source string》not accepted because AXIS argument is missing. (Ch《Channel number》《Block number, label》)
12360	Dimension of argument《Source string》incorrect. (Ch《Channel number》《Block number, label》)
12370	Range of values exceeded for《Source string》. (Ch《Channel number》《Block number, label》)
12380	Maximum memory capacity exceeded. (Ch《Channel number》《Block number, label》)
12390	Type of initial value for《Source string》cannot be converted. (Ch《Channel number》《Block number, label》)
12400	Element of array《Source string》does not exist. (Ch《Channel number》《Block number, label》)
12410	Incorrect index type for《Source string》. (Ch《Channel number》《Block number, label》)
12420	Identifier %3 too long. (Ch《Channel number》《Block number, label》)
12430	Invalid index. (Ch《Channel number》《Block number, label》)
12440	Maximum number of formal arguments exceeded. (Ch《Channel number》《Block number, label》)
12450	Label defined repeatedly. (Ch《Channel number》《Block number, label》)
12460	Maximum number of symbols exceeded with《Source string》. (Ch《Channel number》《Block number, label》)
12470	Unknown G function《Source string》used. (Ch《Channel number》《Block number, label》)
12480	Subroutine《Source string》already defined. (Ch《Channel number》《Block number, label》)
12490	Access permission level《Source string》is not valid. (Ch《Channel number》《Block number, label》)
12500	Do not use《Source string》in this module. (Ch《Channel number》《Block number, label》)

12510	Too many machine data《Source symbol》in block《Block number, label》. (Ch《Channel number》)
12520	Too many tool parameters《Source symbol》in block . (Ch《Channel number》《Block number, label》)
12530	Invalid index for《Source string》. (Ch《Channel number》《Block number, label》)
12540	Too long or too complex. (Ch《Channel number》《Block number, label》)
12550	Identifier《Source symbol》not defined or option does not exist. (Ch《Channel number》《Block number, label》)
12560	Programmed value《Source string》exceeds allowed limits. (Ch《Channel number》《Block number, label》)
12570	Too many motion synchronous actions in《Source symbol》. (Ch《Channel number》《Block number, label》)
12571	Do not use《Source symbol》for motion synchronous actions. (Ch《Channel number》《Block number, label》)
12572	Use《Source symbol》only for motion synchronous actions. (Ch《Channel number》《Block number, label》)
12580	Invalid assignment to《Source symbol》for motion synchronous action. (Ch《Channel number》《Block number, label》)
12581	Invalid read access to《Source symbol》while in motion synchronous action. (Ch《Channel number》《Block number, label》)
12582	Array index《Source symbol》incorrect action. (Ch《Channel number》《Block number, label》)
12583	Variable《Source symbol》no system variable. (Ch《Channel number》《Block number, label》)
12584	Variable《Source symbol》cannot be read synchronously with motion. (Ch《Channel number》《Block number, label》)
12585	Variable《Source symbol》cannot be changed synchronously with motion. (Ch《Channel number》《Block number, label》)
12586	Motion synchronous action: type conflict in variable《Source symbol》. (Ch《Channel number》《Block number, label》)
12587	Motion synchronous action: operator/function《Operator/function》not valid. (Ch《Channel number》《Block number, label》)
12588	Synchronous motion action: address《Address》illegal. (Ch《Channel number》《Block number, label》)
12589	Synchronous motion action: variable《Variable name》not allowed with modal ID. (Ch《Channel number》《Block number, label》)
12590	Global user data cannot be created. (Ch《Channel number》《Block number, label》)
12600	Invalid checksum of line. (Ch《Channel number》《Block number, label》)
12610	Accessing single char with call-by-reference argument not allowed.《Source string》(Ch《Channel number》《Block number, label》)
12620	Accessing this variable as single char not allowed.《Source string》(Ch《Channel number》《Block number, label》)
12630	Satz《Block number, label》skip/label not allowed. (Ch《Channel number》)
12640	Invalid nesting of control structures. (Ch《Channel number》Satz《Block number, label》)
12641	Nesting level of control structures exceeds limit. (Ch《Channel number》《Block number, label》)

12650	Axis《Source number》name different in channel《Channel number with different axis definition》. (Ch《Channel number》《Block number, label》)
12660	Synchronous motion action: variable《Variable name》reserved for synchronous motion actions and technology cycles. (Ch《Channel number》《Block number, label》)
12661	Technology cycle《Name of the technology cycle call》: no further program call possible. (Ch《Channel number》《Block number, label》)
14000	Error at end of file, there are no M30/M02/M17. (Ch《Channel number》《Block number, label》)
14001	Error at end of block, there is no LF. (Ch《Channel number》《Block number, label》)
14010	Invalid default argument in subroutine call. (Ch《Channel number》《Block number, label》)
14011	Program《Program name》not existing or not released. (Ch《Channel number》《Block number, label》)
14012	Lowest subroutine level exceeded. (Ch《Channel number》《Block number, label》)
14013	Number of subroutine passes invalid. (Ch《Channel number》《Block number, label》)
14014	Selected program《Selected program》or access permission not available. (Ch《Channel number》《Block number, label》)
14015	No access permission for file. (Ch《Channel number》)
14020	Wrong value or wrong number of arguments on function or procedure call parameter. (Ch《Channel number》《Block number, label》)
14021	Wrong value or wrong number of arguments on function or procedure call parameter. (Ch《Channel number》《Block number, label》)
14025	Synchronous motion action: illegal modal ID. (Ch《Channel number》《Block number, label》)
14026	Synchronous motion action: invalid polynomial in the FCTDEF command. (Ch《Channel number》《Block number, label》)
14040	Error in end point of circle. (Ch《Channel number》《Block number, label》)
14045	Error in tangent circle programming. (Ch《Channel number》《Block number, label》)
14050	Nesting depth for arithmetic operations exceeded. (Ch《Channel number》《Block number, label》)
14051	Arithmetic error in part program. (Ch《Channel number》《Block number, label》)
14060	Invalid skip with differential block skip. (Ch《Channel number》《Block number, label》)
14070	Memory for variables not sufficient for subroutine. (Ch《Channel number》《Block number, label》)
14080	Jump destination not found. (Ch《Channel number》《Block number, label》)
14090	Invalid D number. (Ch《Channel number》《Block number, label》)
14091	Invalid function, index《Index》. (Ch《Channel number》《Block number, label》)
14092	Axis《Axis name, spindle number》has wrong axis type. (Ch《Channel number》《Block number, label》)
14093	Path interval zero or negative with polynomial interpolation. (Ch《Channel number》《Block number, label》)
14094	Polynomial degree greater than 3 programmed for polynomial interpolation. (Ch《Channel number》《Block number, label》)
14095	Circle radius too small. (Ch《Channel number》《Block number, label》)
14096	Type conversion not possible. (Ch《Channel number》《Block number, label》)
14097	String cannot be converted to AXIS type. (Ch《Channel number》《Block number, label》)
14098	Conversion error: not a number. (Ch《Channel number》《Block number, label》)

14099	Result in string concatenation too long. (Ch《Channel number》《Block number, label》)
14100	Orientation transformation not available. (Ch《Channel number》《Block number, label》)
14101	Orientation transformation not active. (Ch《Channel number》《Block number, label》)
14110	Do not mix use of Euler angles and orientation vector components. (Ch《Channel number》《Block number, label》)
14111	Do not mix use of Euler angles, orientation vector and transformation axes. (Ch《Channel number》《Block number, label》)
14112	Programmed orientation path not possible. (Ch《Channel number》《Block number, label》)
14113	Programmed lead angle too large. (Ch《Channel number》《Block number, label》)
14114	Programmed tilt angle too large. (Ch《Channel number》《Block number, label》)
14115	Illegal definition of workpiece surface. (Ch《Channel number》《Block number, label》)
14116	Absolute orientation programmed while ORIPATH is active. (Ch《Channel number》《Block number, label》)
14120	Determination of plane not possible for programmed orientation. (Ch《Channel number》《Block number, label》)
14129	Orientation axes and components of an orientation vector programmed. (Ch《Channel number》《Block number, label》)
14130	Too many initialization values given. (Ch《Channel number》《Block number, label》)
14131	Orientation axes and leading/sideways angle programmed. (Ch《Channel number》《Block number, label》)
14132	Orientation axes not configured correctly. (Ch《Channel number》《Block number, label》)
14133	G code for orientation definition not allowed. (Ch《Channel number》《Block number, label》)
14134	G code for orientation interpolation not allowed. (Ch《Channel number》《Block number, label》)
14150	Illegal tool carrier number programmed or declare.《MD》 (Ch《Channel number》《Block number, label》)
14151	Illegal tool carrier rotation. (Ch《Channel number》《Block number, label》)
14152	Tool carrier : invalid orientation. (Ch《Channel number》《Block number, label》)
14200	Polar incorrectly programmed. (Ch《Channel number》《Block number, label》)
14210	Polar radius too large. (Ch《Channel number》《Block number, label》)
14250	Pole radius negative. (Ch《Channel number》《Block number, label》)
14260	Pole angle too large. (Ch《Channel number》《Block number, label》)
14270	Block《Block number, label》 pole programmed incorrectly. (Ch《Channel number》)
14280	Polar coordinates programmed incorrectly. (Ch《Channel number》《Block number, label》)
14300	Overlaid handwheel motion activated incorrectly. (Ch《Channel number》《Block number, label》)
14310	Handwheel《Handwheel number》 configuration not correct or inactive.
14400	Tool radius compensation active at transformation switchover. (Ch《Channel number》《Block number, label》)
14401	Transformation not available. (Ch《Channel number》《Block number, label》)
14402	Spline active at transformation change. (Ch《Channel number》《Block number, label》)
14403	Preparation and interpolation might not be synchronized. (Ch《Channel number》《Block number, label》)
14404	Invalid argument in selection of transformation. (Ch《Channel number》《Block number, label》)
14410	Spline active at change of geoaxis. (Ch《Channel number》《Block number, label》)

14411	Tool radius compensation active at change of geoaxis. (Ch《Channel number》《Block number, label》)
14412	Transformation active at change of geoaxis. (Ch《Channel number》《Block number, label》)
14413	Fine tool correction: changeover geometry/channel axis not allowed. (Ch《Channel number》《Block number, label》)
14414	Function GEOAX; incorrect call. (Ch《Channel number》《Block number, label》)
14420	Index axis《Axis name》frame not allowed. (Ch《Channel number》《Block number, label》)
14500	Illegal DEF or PROC statement within part program. (Ch《Channel number》《Block number, label》)
14510	PROC statement missing on subroutine call. (Ch《Channel number》《Block number, label》)
14520	Illegal PROC statement in data definition section. (Ch《Channel number》《Block number, label》)
14530	EXTERN and PROC statement do not correspond. (Ch《Channel number》《Block number, label》)
14600	Download buffer《Buffer》cannot be created. (Ch《Channel number》《Block number, label》)
14610	Compensation block not possible. (Ch《Channel number》《Block number, label》)
14650	SETINT instruction uses with invalid input to trigger ASUP. (Ch《Channel number》《Block number, label》)
14660	SETINT statement uses invalid priority level. (Ch《Channel number》《Block number, label》)
14700	Timeout after command to interpreter. (Ch《Channel number》《Block number, label》)
14701	Number of available NC blocks reduced by《Number of non-available blocks》. (Ch《Channel number》《Block number, label》)
14710	Error in initialization sequence during function《Stairs index》. (Ch《Channel number》《Block number, label》)
14720	Axes missing for centerless transformation. (Ch《Channel number》《Block number, label》)
14730	Conflict at activation of centerless transformation. (Ch《Channel number》《Block number, label》)
14740	Tool data missing for centerless grinding. (Ch《Channel number》《Block number, label》)
14745	Centerless grinding not active. (Ch《Channel number》《Block number, label》)
14750	Too many auxiliary functions programmed. (Ch《Channel number》《Block number, label》)
14751	Motion synchronous actions are out of resources. (code:《Identifier》) (Ch《Channel number》《Block number, label》)
14752	Conflict with DELDTG and STOPREOF in synchronous action. (Ch《Channel number》《Block number, label》)
14753	Motion synchronous action uses illegal interpolation type. (Ch《Channel number》《Block number, label》)
14754	Motion synchronous action uses wrong feed type. (Ch《Channel number》《Block number, label》)
14755	Motion synchronous action needs traverse motion. (Ch《Channel number》《Block number, label》)
14756	Motion synchronous action uses wrong value. (Ch《Channel number》《Block number, label》)
14757	Motion synchronous action uses wrong type. (Ch《Channel number》《Block number, label》)
14758	Programmed synchronous value is not available. (Ch《Channel number》《Block number, label》)

14759	Motion synchronous action uses wrong axis type. (Ch《Channel number》《Block number, label》)
14760	Auxiliary function of a group programmed repeatedly. (Ch《Channel number》《Block number, label》)
14761	Synchronous motion action: DELDTG not allowed with active radius compensation. (Ch《Channel number》《Block number, label》)
14762	Too many PLC variables programmed. (Ch《Channel number》《Block number, label》)
14763	Too many link variables programmed. (Ch《Channel number》《Block number, label》)
14764	NCU link cannot transfer all link variables immediately.
14765	NCU link cannot transfer all link variables.
14770	Auxiliary function programmed incorrectly. (Ch《Channel number》《Block number, label》)
14780	Unreleased option used. (Ch《Channel number》《Block number, label》)
14790	Axis《Axis name》currently controlled by PLC. (Ch《Channel number》)《Block number, label》
14800	Programmed path speed less or equal to zero. (Ch《Channel number》《Block number, label》)
14810	Negative axis speed for positioning axis《Axis name》. (Ch《Channel number》《Block number, label》)
14811	Acceleration value of axis/spindle《Spindle name》out of range. (Ch《Channel number》《Block number, label》)
14812	Axis《Axis name》SOFA not available. (Ch《Channel number》《Block number, label》)
14820	Negative value for maximum spindle speed programmed with constant cutting speed. (Ch《Channel number》《Block number, label》)
14821	Error in selection or disabling of GWPS. (Ch《Channel number》《Block number, label》)
14822	Incorrect programming of GWPS. (Ch《Channel number》《Block number, label》)
14823	Error on selection or disabling of tool monitoring. (Ch《Channel number》《Block number, label》)
14824	Conflict with GWPS. (Ch《Channel number》《Block number, label》)
14830	Wrong feed type selected. (Ch《Channel number》《Block number, label》)
14840	Value for constant cutting speed out of range. (Ch《Channel number》《Block number, label》)
14900	Use either center point or end point programming. (Ch《Channel number》《Block number, label》)
14910	Invalid angle of aperture for programmed circle. (Ch《Channel number》《Block number, label》)
14920	Intermediate point of circle incorrect. (Ch《Channel number》《Block number, label》)
15000	Channel-sync instruction using illegal mark. (Ch《Channel number》《Block number, label》)
15010	Program coordination instruction with invalid channel number. (Ch《Channel number》《Block number, label》)
15020	Instruction CHANDATA cannot be executed. Channel《String (CHANDATA parameter)》is not active. (Ch《Channel number》《Block number, label》)
15021	Instruction CHANDATA uses invalid channel number. (Ch《Channel number》《Block number, label》)
15030	Different systems of measurement. (Ch《Channel number》《Block number, label》)
15100	REORG abort caused by overflow of log file. (Ch《Channel number》《Block number, label》)
15110	REORG currently not possible. (Ch《Channel number》《Block number, label》)
15150	Reload from external aborted. (Ch《Channel number》《Block number, label》)
15160	Wrong configuration of block buffer. (Ch《Channel number》《Block number, label》)

15165	Error by translating or interpreting PLC ASUP program《String》. (Ch《Channel number》《Block number, label》)
15170	Program《String》could not be compiled. (Ch《Channel number》《Block number, label》)
15175	Program《String》interfaces could not be built. (Ch《Channel number》《Block number, label》)
15180	Program《String》cannot be executed as INI file. (Ch《Channel number》《Block number, label》)
15185	《Number of detected errors》errors in INI file. (Ch《Channel number》)
15190	Not enough free memory for subroutine call. (Ch《Channel number》《Block number, label》)
15300	Invalid number-of-passed blocks during block search. (Ch《Channel number》《Block number, label》)
15310	File requested during block search is not loaded. (Ch《Channel number》《Block number, label》)
15320	Invalid block search command. (Ch《Channel number》《Block number, label》)
15330	Invalid block number as target of block search. (Ch《Channel number》《Block number, label》)
15340	Invalid label as target of block search. (Ch《Channel number》《Block number, label》)
15350	Target of block search not found. (Ch《Channel number》《Block number, label》)
15360	Invalid target of block search (syntax error). (Ch《Channel number》)
15370	Target of block search not found. (Ch《Channel number》)
15400	Selected initial ini file does not exist. (Ch《Channel number》《Block number, label》)
15410	Initialization file contains invalid M function. (Ch《Channel number》《Block number, label》)
15420	Instruction not accepted in current mode. (Ch《Channel number》《Block number, label》)
15450	Compiled program cannot be stored. (Ch《Channel number》《Block number, label》)
15460	Syntax conflict with modal G functions. (Ch《Channel number》《Block number, label》)
15500	Illegal angle of shear. (Ch《Channel number》《Block number, label》)
15700	Illegal cycles alarm number. (Ch《Channel number》《Block number, label》)
15800	Wrong starting condition for CONTPRON/CONTDCON. (Ch《Channel number》《Block number, label》)
15810	Wrong array dimension for CONTPRON/CONTDCON. (Ch《Channel number》《Block number, label》)
15900	Touch probe not available. (Ch《Channel number》《Block number, label》)
15910	Touch probe not available. (Ch《Channel number》《Block number, label》)
15950	No traverse motion programmed. (Ch《Channel number》《Block number, label》)
15960	No traverse motion programmed. (Ch《Channel number》《Block number, label》)
16000	Invalid value for lifting direction. (Ch《Channel number》《Block number, label》)
16005	Invalid value for lifting distance. (Ch《Channel number》《Block number, label》)
16020	Repositioning in block《Block number, label》is not possible. (Ch《Channel number》)
16100	Spindle《String》not available in channel. (Ch《Channel number》《Block number, label》)
16110	Spindle《String》for dwell time not in speed control. (Ch《Channel number》《Block number, label》)
16120	Invalid index for online tool compensation. (Ch《Channel number》《Block number, label》)
16130	Instruction not allowed with active FTOCON. (Ch《Channel number》《Block number, label》)
16140	FTOCON not allowed. (Ch《Channel number》《Block number, label》)
16150	Invalid spindle no. with PUTFTOCF. (Ch《Channel number》《Block number, label》)
16200	Spindle and polynomial interpolation not available.(Ch《Channel number》《Block number, label》)

16300	Invalid zero crossing of denominator within parameter range. (Ch《Channel number》《Block number, label》)
16400	Positioning axis《Axis name, spindle number》cannot participate in spline interpolation. (Ch《Channel number》《Block number, label》)
16410	Axis《Axis name, spindle number》is not a geometry axis. (Ch《Channel number》《Block number, label》)
16420	Axis《Axis name, spindle number》repeatedly programmed. (Ch《Channel number》《Block number, label》)
16430	Geometry axis《Axis name, spindle number》cannot traverse as positioning axis in rotated coordinate system. (Ch《Channel number》《Block number, label》)
16440	Rotation programmed for non-existent geometry axis. (Ch《Channel number》《Block number, label》)
16500	Chamfer or radius negative. (Ch《Channel number》《Block number, label》)
16510	Facing axis is not defined. (Ch《Channel number》《Block number, label》)
16700	Axis《Axis name, spindle number》invalid feed type. (Ch《Channel number》《Block number, label》)
16710	Axis《Axis name, spindle number》master spindle not programmed. (Ch《Channel number》《Block number, label》)
16715	Axis《Spindle number》master spindle not in standstill. (Ch《Channel number》《Block number, label》)
16720	Axis《Axis name, spindle number》thread lead is zero. (Ch《Channel number》《Block number, label》)
16730	Axis《Axis name, spindle number》wrong parameter for thread cutting. (Ch《Channel number》《Block number, label》)
16740	Geometry axis must be programmed. (Ch《Channel number》《Block number, label》)
16750	Axis《Axis name, spindle number SPCON not programmed. (Ch《Channel number》《Block number, label》)
16751	Spindle/axis《Axis name, spindle number》SPCOF can not be carried out. (Ch《Channel number》《Block number, label》)
16755	No stop needed. (Ch《Channel number》《Block number, label》)
16760	Axis《Axis name, spindle number》S value missing. (Ch《Channel number》《Block number, label》)
16761	Axis/spindle《Axis name, spindle number》not programmable in channel. (Ch《Channel number》《Block number, label》)
16762	Spindle《Axis name, spindle number》function of thread or drill is active. (Ch《Channel number》《Block number, label》)
16763	Axis《Axis name, spindle number》programmed speed is illegal (zero or negative). (Ch《Channel number》《Block number, label》)
16770	Axis《Axis name, spindle number》encoder missing. (Ch《Channel number》《Block number, label》)
16771	Slave axis《Axis name, spindle number》overlay movement not enabled. (Ch《Channel number》)
16776	Curve table《Curve table number》does not exist for axis《Axis name, spindle number》. (Ch《Channel number》《Block number, label》)

16777	Coupling: lead axis《Axis name, spindle number》 slave axis《Axis name, spindle number》 not available, (Ch《Channel number》《Block number, label》)
16778	Coupling: ring coupling for slave axis《Axis name, spindle number》 and lead axis《Axis name, spindle number》 not allowed. (Ch《Channel number》《Block number, label》)
16779	Coupling: too many couplings for axis《Axis name, spindle number》. See active leading axis《Axis name, spindle number》. (Ch《Channel number》《Block number, label》)
16780	Slave axis/spindle missing. (Ch《Channel number》《Block number, label》)
16781	Master axis/spindle missing. (Ch《Channel number》《Block number, label》)
16782	Slave axis/spindle《Axis name, spindle number》 currently not available. (Ch《Channel number》《Block number, label》)
16783	Master axis/spindle《Axis name, spindle number》 currently not available. (Ch《Channel number》《Block number, label》)
16785	Master and slave axis spindle《Axis name, spindle number》 are identical. (Ch《Channel number》《Block number, label》)
16787	Coupling parameter has not been changed. (Ch《Channel number》《Block number, label》)
16788	Coupling definition is cyclic as a result. (Ch《Channel number》《Block number, label》)
16789	Axis/spindle used in another coupling definition. (Ch《Channel number》《Block number, label》)
16790	Coupling parameter is zero or missing. (Ch《Channel number》《Block number, label》)
16791	Coupling parameter neglected. (Ch《Channel number》《Block number, label》)
16792	Too many couplings for axis/spindle《Axis name, spindle number》. (Ch《Channel number》《Block number, label》)
16793	Coupling of axis《Axis name, spindle number》 prohibits switchover of transformation. (Ch《Channel number》《Block number, label》)
16794	Coupling of axis/spindle《Axis name, spindle number》 prohibits referencing. (Ch《Channel number》《Block number, label》)
16795	String cannot be interpreted. (Ch《Channel number》《Block number, label》)
16796	Coupling not defined. (Ch《Channel number》《Block number, label》)
16797	Coupling is active. (Ch《Channel number》《Block number, label》)
16798	Axis《Axis name, spindle number》 is slave axis and does not permit axis container rotation. (Ch《Channel number》《Block number, label》)
16799	Axis《Axis name, spindle number》 is master axis and does not permit axis container rotation. (Ch《Channel number》《Block number, label》)
16800	Traverse instruction DC/CDC for axis《Axis name, spindle number》 not allowed. (Ch《Channel number》《Block number, label》)
16810	Traverse instruction ACP for axis《Axis name, spindle number》 not allowed. (Ch《Channel number》《Block number, label》)
16820	Traverse instruction ACN for axis《Axis name, spindle number》 not allowed. (Ch《Channel number》《Block number, label》)
16830	Invalid position for axis/spindle《Axis name, spindle number》 programmed. (Ch《Channel number》《Block number, label》)
16903	Action《Action number, action name》 <ALNX> is not allowed in current status. (Ch《Channel number》)
16904	Action《Action number, action name》 <ALNX> is not allowed in current status. (Ch《Channel number》)

16905	Action《Action number, action name》<ALNX> is not allowed. (Ch《Channel number》)
16906	Action《Action number, action name》<ANLX> was aborted by alarm. (Ch《Channel number》)
16907	Action《Action number, action name》<ANLX> is only possible in stop. (Ch《Channel number》)
16908	Action《Action number, action name》<ALNX> is only possible in reset or at the block end. (Ch《Channel number》)
16909	Action《Operation number/operation name》<ALNX> is not allowed in current operating mode. (Ch《Channel number》)
16911	Mode change is not allowed. (Ch《Channel number》)
16912	Action《Operation number/action name》<ALNX> only possible in reset. (Ch《Channel number》)
16913	Mode group《Mode group number》Channel《Channel number》mode group change:《Action number/action name》<ALNX> not allowed.
16914	Mode group《Mode group number》Channel《Channel number》mode group change:《Action number/action name》<ALNX> not allowed.
16915	Action《Action name》<ALNX> not allowed in the current block. (Ch《Channel number》)
16916	Repositioning: action《Action number/action name》<ALNX> not allowed in the current state. (Ch《Channel number》)
16918	《Action number/action name》<ALNX> action needs reset in all channels. (Ch《Channel number》)
16919	Action《Action number/action name》<ALNX> is not allowed, because of an alarm. (Ch《Channel number》)
16920	Action《Action number/action name》<ALNX> is already active. (Ch《Channel number》)
16921	Mode group《Mode group number》machine data: channel/mode group assignment not allowed or double. (Ch《Channel number》)
16922	Subprograms: action《Action number/action name》<ALNX> maximum stack level exceeded. (Ch《Channel number》)
16927	Action《Action number/action name》<ALNX> at active interrupt treatment not allowed. (Ch《Channel number》)
16930	Predecessor and current block《Block number》must be separated by an executable block. (Ch《Channel number》)
16931	Subroutine programs: action《Action number/action name》<ALNX> maximum stack level exceeded. (Ch《Channel number》)
17000	Maximum number of symbols exceeded. (Ch《Channel number》《Block number, label》)
17001	No memory left for tool or magazine data. (Ch《Channel number》《Block number, label》)
17010	No memory left for symbol. (Ch《Channel number》《Block number, label》)
17020	1st array index out of range. (Ch《Channel number》《Block number, label》)
17030	2nd array index out of range. (Ch《Channel number》《Block number, label》)
17040	Illegal axis index. (Ch《Channel number》《Block number, label》)
17050	Illegal value. (Ch《Channel number》《Block number, label》)
17060	Requested data area too large. (Ch《Channel number》《Block number, label》)
17070	Data is write-protected. (Ch《Channel number》《Block number, label》)
17080	《%3》value violates lower limit. (Ch《Channel number》《Block number, label》)
17090	《%3》value violates upper limit. (Ch《Channel number》《Block number, label》)

17100	Digital input/comparator no. 《Input number》 is not active. (Ch 《Channel number》《Block number, label》)
17110	Digital output no. 《Output number》 is not active. (Ch 《Channel number》《Block number, label》)
17120	Analog input no. 《Input number》 is not active. (Ch 《Channel number》《Block number, label》)
17130	Analog output no. 《Output number》 is not active. (Ch 《Channel number》《Block number, label》)
17140	NCK output no. 《Output number》 is assigned to function via machine data. (Ch 《Channel number》《Block number, label》)
17150	Maximum 《Quantity》 NCK-output per block exceeded. (Ch 《Channel number》《Block number, label》)
17160	Tool is not selected. (Ch 《Channel number》《Block number, label》)
17170	Too many symbols defined. (Ch 《Channel number》《Block number, label》)
17180	Illegal D number. (Ch 《Channel number》《Block number, label》)
17181	T number = 《%3》, D number = 《%4》 does not exist. (Ch 《Channel number》《Block number, label》)
17182	Illegal total offset number. (Ch 《Channel number》《Block number, label》)
17188	D number 《Offset number D》 defined for tool T number 《T number of first tool》 and 《T number of second tool》. (Ch 《Channel number》)
17189	Channel, D number 《Offset number D》 of the tools at magazine/magazine location 《Magazine/location number of first tool》 and 《Magazine/location number of second tool》 defined.
17190	Illegal T number. (Ch 《Channel number》《Block number, label》)
17191	T = 《T number or T identifier》 does not exist. Program 《Program name》. (Ch 《Channel number》《Block number, label》)
17192	Unit 《TO unit》 invalid tool name for 《Tool name》, duplo no. 《Duplo number》. No further replacement tools possible in '《Group identifier》'.
17194	No suitable tool found. (Ch 《Channel number》《Block number, label》)
17200	Cannot delete tool data. (Ch 《Channel number》《Block number, label》)
17202	Cannot delete magazine data. (Ch 《Channel number》《Block number, label》)
17210	Access to variable not possible. (Ch 《Channel number》《Block number, label》)
17220	Tool not available. (Ch 《Channel number》 《Block number, label》)
17230	Duplo no. already disposed. (Ch 《Channel number》 《Block number, label》)
17240	Invalid definition of tool. (Ch 《Channel number》《Block number, label》)
17250	Invalid definition of magazine. (Ch 《Channel number》《Block number, label》)
17260	Invalid definition of magazine location. (Ch 《Channel number》《Block number, label》)
17262	Illegal tool adapter operation. (Ch 《Channel number》 《Block number, label》)
17270	Call-by-reference: illegal variable. (Ch 《Channel number》 《Block number, label》)
17500	Axis 《Axis name, spindle number》 is not an indexing axis. (Ch 《Channel number》《Block number, label》)
17501	Indexing axis 《Axis name》 with Hirth tooth system is active. (Ch 《Channel number》 《Block number, label》)
17502	Indexing axis 《Axis name》 with Hirth tooth system Stop delayed. (Ch 《Channel number》《Block number, label》)

17503	Indexing axis《Axis name》with Hirth tooth system and axis not referenced. (Ch《Channel number》《Block number, label》)
17510	Invalid index for indexing axis《Axis name, spindle number》. (Ch《Channel number》《Block number, label》)
17600	Preset on transformation axis《Axis name, spindle number》not possible. (Ch《Channel number》《Block number, label》)
17610	Positioning axis《Axis name, spindle number》cannot participate in transformation. (Ch《Channel number》《Block number, label》)
17620	Fixpoint cannot be approached for transformed axis《Axis name, spindle number》. (Ch《Channel number》《Block number, label》)
17630	Referencing not possible for transformed axis《Axis name, spindle number》. (Ch《Channel number》《Block number, label》)
17640	Spindle cannot be used as transformed axis《Axis name, spindle number》. (Ch《Channel number》《Block number, label》)
17650	Machine axis《Axis name, spindle number》not programmable. (Ch《Channel number》《Block number, label》)
17800	Illegal fixed-stop end point programmed. (Ch《Channel number》《Block number, label》)
17900	Axis《Axis name, spindle number》use machine axis identifier. (Ch《Channel number》《Block number, label》)
18000	Wrong definition of global protection area《Number of global protection zone》, error code《Error number》. (Ch《Channel number》《Block number, label》)
18001	Wrong definition of channel-specific protection area《Number of the channel-specific protection zone》, error code《Error number》. (Ch《Channel number》《Block number, label》)
18002	Global protection area《Number of global protection zone》cannot be activated, error code《Error number》. (Ch《Channel number》《Block number, label》)
18003	Channel-specific protection area《Number of the channel-specific protection zone》cannot be activated, error code《Error number》. (Ch《Channel number》《Block number, label》)
18004	Orientation of workpiece-related protection area %3 does not correspond to the orientation of tool-related protection area《Number of workpiece-related protection zone》. (Ch《Channel number》《Block number, label》)
18005	Serious error in definition of global protection area《Protection zone number》. (Ch《Channel number》《Block number, label》)
18006	Serious error in definition of channel-specific protection area《Protection zone number》. (Ch《Channel number》《Block number, label》)
18100	Invalid argument passed to FXS. (Ch《Channel number》《Block number, label》)
18101	Invalid argument passed to FXST. (Ch《Channel number》《Block number, label》)
18102	Invalid argument passed to FXSW. (Ch《Channel number》《Block number, label》)
18200	Curve table: block search stop not allowed with definition CTABDEF. (Ch《Channel number》《Block number, label》)
18201	Curve table: table《Number of curve table》does not exist. (Ch《Channel number》《Block number, label》)
18202	Curve table: instruction CTABEND illegal without CTABDEF. (Ch《Channel number》《Block number, label》)
18300	Frame: interpretation not possible. (Ch《Channel number》《Block number, label》)

18310	Frame: rotation not allowed. (Ch《Channel number》《Block number, label》)
18311	Frame: instruction not allowed. (Ch《Channel number》《Block number, label》)
18312	Frame: fine offset not configured. (Ch《Channel number》《Block number, label》)
18400	Language selection not possible: 《Cause》. (Ch《Channel number》《Block number, label》)

1.3 Axis/Spindle Alarm

20000	Axis《Axis name, spindle number》reference cam not reached. (Ch《Channel number》)
20001	Axis《Axis name, spindle number》cam signal missing. (Ch《Channel number》)
20002	Axis《Axis name, spindle number》zero reference mark not found. (Ch《Channel number》)
20003	Axis《Axis name, spindle number》encoder error. (Ch《Channel number》)
20004	Axis《Axis name, spindle number》reference mark missing. (Ch《Channel number》)
20005	Axis《Axis name, spindle number》reference point approach aborted. (Ch《Channel number》)
20006	Axis《Axis name, spindle number》reference point creep velocity not reached. (Ch《Channel number》)
20007	Axis《Axis name, spindle number》reference point approach needs 2 encoders. (Ch《Channel number》)
20008	Axis《Axis name, spindle number》reference point approach needs second referenced encoder. (Ch《Channel number》)
20050	Axis《Axis name, spindle number》handwheel mode active. (Ch《Channel number》)
20051	Axis《Axis name, spindle number》handwheel mode not possible. (Ch《Channel number》)
20052	Axis《Axis name, spindle number》already active. (Ch《Channel number》)
20053	Axis《Axis name, spindle number》DRF, FTOCON, external setting of offset not possible. (Ch《Channel number》)
20054	Axis《Axis name, spindle number》wrong index for indexing axis in JOG mode. (Ch《Channel number》)
20055	Master spindle not available in JOG mode. (Ch《Channel number》)
20056	Axis《Axis name, spindle number》no revolutional feedrate possible. Axis/spindle《Axis name, spindle number》stationary. (Ch《Channel number》)
20057	Revolution velocity of axis/spindle《Axis name, spindle number》is less or equal zero. (Ch《Channel number》《Block number, label》)
20060	Axis《Axis name, spindle number》cannot move as geometry axis. (Ch《Channel number》)
20061	Axis《Axis name》cannot move as orientation axis. (Ch《Channel number》)
20062	Axis《Axis name, spindle number》already active. (Ch《Channel number》)
20063	Axis《Axis name》cannot move orientation axes without transformation. (Ch《Channel number》)
20065	Master spindle not defined for geometry axes in JOG mode. (Ch《Channel number》)
20070	Axis《Axis number》programmed end position is beyond software limit《+ or -》. (Ch《Channel number》)
20071	Axis《Axis number》programmed end position is beyond working area limit《+ or -》. (Ch《Channel number》)
20072	Axis《Axis number》is not an indexing axis. (Ch《Channel number》)
20073	Axis《Axis number》cannot be repositioned. (Ch《Channel number》)
20074	Wrong index position.
20075	Axis《Axis number》oscillating currently not possible. (Ch《Channel number》)
20076	Axis《Axis number》change of operation mode not possible during oscillation. (Ch《Channel number》)
20077	Axis《Axis number》programmed position is beyond software limit《+ or -》. (Ch《Channel number》)

20078	Axis《Axis number》programmed position is beyond working area limit《+ or -》. (Ch《Channel number》)
20079	Axis《Axis number》oscillating path length《Length》 <= 0. (Ch《Channel number》)
20080	Axis《Axis number》handwheel not assigned for overlaid handwheel motion. (Ch《Channel number》)
20085	Contour handwheel: traverse direction or overtravel not allowed from beginning of block. (Ch《Channel number》)
20090	Axis《Axis name, spindle number》activation of fixed stop not possible. Check program line and axis parameters.
20091	Axis《Axis name, spindle number》has not reached fixed stop.
20092	Axis《Axis name, spindle number》fixed stop mode still active.
20093	Axis《Axis name, spindle number》standstill monitoring at fixed-stop end point has triggered.
20094	Axis《Axis name, spindle number》fixed-stop mode has been aborted.
20100	Invalid configuration for digitizing. (Ch《Channel number》)
20101	Timeout during initialization of communication with the digitizer.
20105	Axis stopped by digitizer. Error code《Error code of digitizing unit》. (Ch《Channel number》)
20106	Emergency stop set by the digitizer.
20108	Invalid data packet received from the digitizer. Error codes:《Error code of cyclic packet》,《Error code of out-of-band packet》.
20109	Error in communication with the digitizer: status code of com-circuit:《Status byte》.
20120	Axis《Axis name, spindle number》too many relations defined for cross error compensation.
20121	Axis《Axis name, spindle number》configuration error in cross error compensation table《Compensation table》.
20122	Invalid axis assignment for cross error compensation table《Compensation table》.
20123	Axis《Axis name, spindle number》assignment of different output axes in cress error compensation table to be multiplied.
20124	Axis《Axis name, spindle number》sum of compensation values has been limited.
20125	Axis《Axis name, spindle number》variation of compensation value is too rapid.
20130	Contour tunnel monitoring. (Ch《Channel number》)
20140	Motion synchronous action: traversing of command axis《Axis name》. See NC alarm《Alarm number》. (Ch《Channel number》)
20141	Command axis《Axis name》: illegal axis type. (Ch《Channel number》)
20145	Motion synchronous action: arithmetic error. (Ch《Channel number》《Block number》)
20146	Motion synchronous action: nesting depth exceeded. (Ch《Channel number》《Block number》)
20147	Motion synchronous action: command not executable. (Ch《Channel number》《Block number》)
20148	Motion synchronous action: internal error《Error number》. (Ch《Channel number》《Block number》)
20149	Motion synchronous action: illegal index. (Ch《Channel number》《Block number 》)
20150	PLC terminates the interrupted command. (Ch《Channel number》)
20160	Tool management: PLC can terminate only incorrectly aborted commands. (Ch《Channel number》)
20170	Illegal configuration $AC_FIFO. (Ch《Channel number》)
20200	Invalid spindle no.《Spindle number》with fine compensation of tool geometry. (Ch《Channel number》)

20201	Spindle《Spindle number》 no tool assigned. (Ch《Channel number》)
20203	No tool selected. (Ch《Channel number》)
20204	Instruction PUTFTOC not allowed during FTOCOF. (Ch《Channel number》)
20210	Spindle《Spindle number, label》 wrong values for centerless grinding. (Ch《Channel number》《Block number》)
20211	Spindle《Spindle number, label》 support point beyond limits. (Ch《Channel number》《Block number》)
21610	Channel《Channel number》axis《Axis name, spindle number》 encoder《String (encoder number)》 frequency limit exceeded.
21612	Axis《Axis name, spindle number》 VDI-signal 'drive enable' reset during traverse motion. (Ch《Channel number》)
21613	Axis《Axis name, spindle number》 switches active encoder.
21614	Axis《Axis name, spindle number》 hardware limit switch《String (+,- or +/-)》 reached. (Ch《Channel number》)
21615	Axis《Axis name, spindle number》 taken from traverse mode to follow-up mode. (Ch《Channel number》)
21616	Overlaid motion active at transformation switchover. (Ch《Channel number》《Block number, label》)
21617	Transformation prohibits to traverse the pole. (Ch《Channel number》《Block number, label》)
21618	Channel《Channel number》Block《Block number, label》 transformation active: overlaid motion too great.
21619	Transformation active: motion not possible. (Ch《Channel number》《Block number, label》)
21650	Axis《Axis name, spindle number》 overlaid motion not allowed. (Ch《Channel number》)
21700	Axis《Axis name, spindle number》 touch probe already deflected, edge polarity not possible. (Ch《Channel number》《Block number》)
21701	Axis《Axis name, spindle number》 measurement not possible. (Ch《Channel number》《Block number》)
21702	Axis《Axis name, spindle number》 measurement aborted. (Ch《Channel number》《Block number》)
21703	Axis《Axis name, spindle number》 touch probe not deflected, edge polarity not possible. (Ch《Channel number》《Block number》)
21740	Output value at analog output no.《Number of the output》 has been limited.
21750	Error during output of cam signals via timer.
21760	Too many auxiliary functions programmed. (Ch《Channel number》《Block number, label》)
22000	Spindle《Axis name, spindle number》 change of gear stage not possible. (Ch《Channel number》《Block number, label》)
22010	Spindle《Spindle number》 actual gear stage differs from requested gear stage. (Ch《Channel number》《Block number, label》)
22040	Spindle《Axis name, spindle number》 is not referenced with zero marker. (Ch《Channel number》《Block number, label》)
22050	Spindle《Axis name, spindle number》 transition from speed control mode to position control mode not possible. (Ch《Channel number》《Block number, label》)
22051	Spindle《Axis name, spindle number》 reference mark not found. (Ch《Channel number》《Block number, label》)

22052	Spindle《Axis name, spindle number》zero speed on block change not reached. (Ch《Channel number》《Block number, label》)
22053	Spindle《Axis name, spindle number》reference mode not supported. (Ch《Channel number》《Block number, label》)
22054	Spindle《Axis name, spindle number》improper punch signal. (Ch《Channel number》《Block number, label》)
22055	Spindle《Axis name, spindle number》configured positioning speed is too high. (Ch《Channel number》《Block number, label》)
22060	Position control expected for axis/spindle《Axis name, spindle number》. (Ch《Channel number》)
22062	Axis《Axis name, spindle number》reference point approach: search speed for zero mark (MD) is not reached. (Ch《Channel number》)
22064	Axis《Axis name, spindle number》reference point approach: search speed for zero mark (MD) is too high. (Ch《Channel number》)
22065	Tool management: tool move not possible since there is no tool《String (identifier)》with duplo no.《Duplo no.》in magazine《Magazine no.》. (Ch《Channel number》)
22066	Tool management: tool change not possible since tool《String (identifier)》with duplo no.《Duplo no.》not in magazine《Magazine no.》. (Ch《Channel number》)
22067	Tool management: too change not possible because no tool ready in tool group《String (identifier)》. (Ch《Channel number》)
22068	Tool management: no tool available in tool group《String (identifier)》. (Ch《Channel number》《Block number, label》)
22069	Tool management : no tool available in tool group《String (identifier)》, program《Program name》. (Ch《Channel number》《Block number, label》)
22070	Tool unit《TO unit》Please change tool T=《T number of tool》. Repeat data backup.
22071	Unit《TO unit》tool《T number of tool》duplo no《Duplo number》is active, but not in the active wear grouping.
22100	Spindle《Axis name, spindle number》chuck speed exceeded. (Ch《Channel number》《Block number, label》)
22101	Spindle《Axis name, spindle number》maximum speed for encoder resynchronization exceeded. (Ch《Channel number》《Block number, label》)
22150	Spindle《Axis name, spindle number》maximum speed for position control exceeded. (Ch《Channel number》《Block number, label》)
22200	Spindle《Axis name, spindle number》axis stopped during tapping. (Ch《Channel number》)
22250	Spindle《Axis name, spindle number》axis stopped during thread cutting.(Ch《Channel number》)
22260	Spindle《Axis name》thread might be damaged. (Ch《Channel number》)
22270	Maximum velocity of thread axis reached at position《Position》. (Ch《Channel number》《Block number, label》)
22280	Block《Block number, label》in Channel《Channel number》: Program acceleration path too short《Program acceleration path》, need《Required acceleration path》.
22320	PUTFTOCF data block could not be transferred. (Ch《Channel number》《Block number, label》)
22321	Axis《Axis name, spindle number》PRESET not allowed during traverse motion. (Ch《Channel number》)
22322	Axis《Axis name, spindle number》PRESET: invalid value. (Ch《Channel number》)

25000	Axis《Axis name, spindle number》hardware fault of active encoder.
25001	Axis《Axis name, spindle number》hardware fault of passive encoder.
25010	Axis《Axis name, spindle number》pollution of passive encoder.
25011	Axis《Axis name, spindle number》pollution of passive encoder.
25020	Axis《Axis name, spindle number》zero mark monitoring of passive encoder.
25021	Axis《Axis name, spindle number》zero mark monitoring of passive encoder.
25030	Axis《Axis name, spindle number》actual velocity alarm.
25031	Axis《Axis name, spindle number》actual velocity warning.
25040	Axis《Axis name, spindle number》standstill monitoring.
25050	Axis《Axis name, spindle number》contour monitoring.
25060	Axis《Axis name, spindle number》desired speed limit.
25070	Axis《Axis name, spindle number》drift limit exceeded.
25080	Axis《Axis name, spindle number》positioning monitoring.
25100	Axis《Axis name, spindle number》switchover of encoder not possible.
25105	Axis《Axis name, spindle number》positions tolerance exceeded.
25110	Axis《Axis name, spindle number》selected encoder not available.
25200	Axis《Axis name, spindle number》requested set of parameters invalid.
25201	Axis《Axis name, spindle number》drive fault.
26000	Axis《Axis name, spindle number》clamping monitoring.
26001	Axis《Axis name, spindle number》configuration error in friction compensation.
26002	Axis《Axis name, spindle number》encoder《Encoder number》configuration error: encoder marks.
26003	Axis《Axis name, spindle number》invalid lead screw pitch.
26004	Axis《Axis name, spindle number》linear encoder《Encoder number》invalid grid point distance.
26005	Axis《Axis name, spindle number》invalid output rating configured.
26006	Axis《Axis name, spindle number》encoder《Encoder number》type/output type《Encoder type/ output type》not possible.
26007	Axis《Axis name, spindle number》invalid coarse step size for quadrant error compensation.
26008	Axis《Axis name, spindle number》invalid fine step size for quadrant error compensation.
26009	Axis《Axis name, spindle number》memory overflow for quadrant error compensation steps.
26010	Axis《Axis name, spindle number》invalid acceleration characteristic for quadrant error compensation.
26011	Axis《Axis name, spindle number》invalid measuring periods for quadrant error compensation.
26012	Axis《Axis name, spindle number》feed forward control not active for quadrant error compensation.
26014	Axis《Axis name, spindle number》machine data《String: MD identifier》invalid value.
26015	Axis《Axis name, spindle number》machine data《String: MD identifier》[《Index: MD array index》] invalid value.
26016	Axis《Axis name, spindle number》machine data《String: MD identifier》invalid value.
26017	Axis《Axis name, spindle number》machine data《String: MD identifier》[《Index: MD array index》] invalid value.
26018	Axis《Axis name, spindle number》control output branch drive《Drive number》multiply used.
26019	Axis《Axis name, spindle number》encoder《Encoder number》measurement not possible with this controller module.

26020	Axis《Axis name, spindle number》 hardware fault《Error fine coding》 during encoder《Encoder number》 initialization.
26022	Axis《Axis name, spindle number》 measurement not supported, encoder simulation.
26030	Axis《Axis name, spindle number》 encoder《Encoder number》 absolute position lost.
26050	Axis《Axis name, spindle number》 parameter block change from《Index: current parameter block》 to《Index: new parameter block》 not possible.
26051	《Block number, label》 channel in block《Channel number》: unnaticipated stop crossed in continuous path mode.
26052	Channel《Channel number》 in Block《Block number, label》: path velocity too high for auxiliary function output.
26100	Axis《Axis name, spindle number》 drive《Drive number》 is not working.
26110	Independent drive stop/retract triggered.
27000	Axis《Axis number》 is not safely referenced.
27001	Axis《Axis number》 error in cross check, code《Additional info cross-comparison index》, value NCK《Additional info comparison value NCK》, drive《Additional info comparison value drive》.
27002	Axis《Axis number》 stop test is running.
27003	Checksum error has occurred:《Note on code section or table》《Table number》.
27010	Axis《Axis number》 safe standstill monitoring.
27011	Axis《Axis number》 safe velocity monitoring.
27012	Axis《Axis number》 safe position monitoring.
27013	Axis《Axis number》 safe stopping monitoring.
27020	Axis《Axis number》 stop E triggered.
27021	Axis《Axis number》 stop D triggered.
27022	Axis《Axis number》 stop C triggered.
27023	Axis《Axis number》 stop B triggered.
27024	Axis《Axis number》 stop A triggered.
27030	Axis《Axis number》 function not supported on this 611D module.
27031	Axis《Axis number》 limit for safe velocity《Limit value index》 (Gear ratio《Number of the transmission ratio》) too large. (Max《Maximum velocity》).
27032	Axis《Axis number》 drive《Drive number》 safety checksum invalid. Please confirm and re-test safety functions.
27033	Axis《Axis number》 parameter assignment of MD《Machine data identifier》,《Machine data index》 invalid.
27090	Error occurring during crosswise data comparison NCK-PLC《Name of system variable in which the error was detected》 [《Array index extension》]. NCK:《NCK comparison value extension》.
27091	Error occurring during crosswise data comparison NCK-PLC, Stop of《Extension indicating the monitoring channel that triggered the stop》.
27092	Communication interrupted during comparison NCK-PLC, error detected by《Extension indicating the monitoring channel that detected the error》.
27093	Checksum error NCK-SPL,《Extension indicating the type or error》,《Extension indicating the reference variable》,《Extension indicating the actual variable》.
27094	Write access to system variable《Name of safety system variable》 only allowed from NCK-SPL.
28000	NCU link connection to all NCUs of the link network has been canceled.
28001	NCU link connection to NCU《NCU number》 of the link network has been canceled.

28002	Error on activation of machine data, NCU network-wide machine data were modified by NCU《NCU number》.
28004	NCU link: NCU《NCU number》of the link network is not on the bus.
28005	NCU link: NCU《NCU number》of the link network not running synchronously.
28007	NCU link: conflict in configuration data of NCU《NCU number》.
28008	NCU link: Conflict in timer setting NCU《NCU number》.
28009	NCU link: Conflict in bus parameters of NCU《NCU number》.
28010	NCU link: NCU《NCU number》has not received a message.
28011	Interpolator time insufficient for NCU link. Link cycle time:《Micro seconds》us.
28012	NCU link: Synchronization cycle signal missing《Number of cycles》times.
28030	Serious alarm on NCU《NCU number》, axes are trailing.
28031	Serious alarm on NCU《NCU number》, axes are trailing.
28032	Emergency stop activated on NCU《NCU number》, axes are trailing.
28033	Emergency stop on NCU《NCU number》, axes continue to trail.

1.4 Cycle Alarm (Standard)

60000	Customer cycle. (Standard)
61000	Customer cycle. (Standard)
62000	Customer cycle. (Standard)
63000	Customer cycle. (Standard)

61000	Tool offset is not valid. (Ch《Channel number》《Block number》)
61001	Definition of screw thread is wrong. (Ch《Channel number》《Block number》)
61002	Definition of machining type is wrong. (Ch《Channel number》《Block number》)
61003	Feeding is not programmed during cycle. (Ch《Channel number》《Block number》)
61004	Setting of geometry axis is wrong. (Ch《Channel number》《Block number》)
61005	3rd geometry axis is not used. (Ch《Channel number》《Block number》)
61006	Tool diameter is too big. (Ch《Channel number》《Block number》)
61007	Tool diameter is too small. (Ch《Channel number》《Block number》)
61008	There is no valid tool. (Ch《Channel number》《Block number》)
61009	Tool number selected is 0. (Ch《Channel number》《Block number》)
61010	Finishing tolerance is too big. (Ch《Channel number》《Block number》)
61011	Scaling is not allowed. (Ch《Channel number》《Block number》)
61012	Different scaling in plane. (Ch《Channel number》《Block number》)
61013	Basic setting is changed. Program is not executed. (Ch《Channel number》《Block number》)
61014	Exceeded return plane. (Ch《Channel number》《Block number》)
61015	Contour is not defined. (Ch《Channel number》《Block number》)
61101	Definition of reference plane is wrong. (Ch《Channel number》《Block number》)
61102	Direction of spindle is not programmed. (Ch《Channel number》《Block number》)
61103	Number of bore is 0. (Ch《Channel number》《Block number》)
61104	Slot contour invasion violation. (Ch《Channel number》《Block number》)
61105	Milling cutter radius is too big. (Ch《Channel number》《Block number》)
61106	Number of interval of circle factor. (Ch《Channel number》《Block number》)
61107	Definition of first drilling depth is wrong. (Ch《Channel number》《Block number》)
61108	Parameter of _RAD1 and _DP1 is not allowed. (Ch《Channel number》《Block number》)
61109	Definition of parameter _CDIR is wrong. (Ch《Channel number》《Block number》)
61110	Finishing tolerance at bottom > Feeding depth. (Ch《Channel number》《Block number》)
61111	Feeding width > Tool diameter. (Ch《Channel number》《Block number》)
61112	Tool diameter is negative. (Ch《Channel number》《Block number》)
61113	Parameter _CRAD is too big for radius. (Ch《Channel number》《Block number》)
61114	Definition of correction direction G41/G42 is wrong. (Ch《Channel number》《Block number》)
61115	Definition of approach or retract mode (sttraight line/circle/plane/space) is wrong. (Ch《Channel number》《Block number》)
61116	Approach or retract pass = 0. (Ch《Channel number》《Block number》)
61117	Valid tool diameter is 0 or negative. (Ch《Channel number》《Block number》)
61118	Length or width = 0. (Ch《Channel number》《Block number》)
61119	Diameter is programmed wrong. (Ch《Channel number》《Block number》)

61120	Inner/outer screw thread type is not defined. (Ch《Channel number》《Block number》)
61121	No tooth number for a blade. (Ch《Channel number》《Block number》)
61122	Definition of safe distance in plane is wrong. (Ch《Channel number》《Block number》)
61123	CYCLE72 cannot be simulated. (Ch《Channel number》《Block number》)
61124	Feeding width is not programmed. (Ch《Channel number》《Block number》)
61200	Too many elements in machining block. (Ch《Channel number》《Block number》)
61201	Machining block sequence is wrong. (Ch《Channel number》《Block number》)
61202	No technical cycle. (Ch《Channel number》《Block number》)
61203	No position cycle. (Ch《Channel number》《Block number》)
61204	Dimension is too small. (Ch《Channel number》《Block number》)
61205	Positioning cycle unknown. (Ch《Channel number》《Block number》)
61210	Block search element is not found. (Ch《Channel number》《Block number》)
61211	No absolute reference. (Ch《Channel number》《Block number》)
61212	Tool type is wrong. (Ch《Channel number》《Block number》)
61213	Circle radius is too small. (Ch《Channel number》《Block number》)
61214	Lead is not programmed. (Ch《Channel number》《Block number》)
61215	Dimension before finishing is programmed wrong. (Ch《Channel number》《Block number》)
61216	Valid only when feed/tooth is same as cutting tool. (Ch《Channel number》《Block number》)
61217	Cutting is programmed for tool diameter 0. (Ch《Channel number》《Block number》)
61218	Although tool number is 0, feed/tooth is programmed. (Ch《Channel number》《Block number》)
61219	Tool diameter is too big. (Ch《Channel number》《Block number》)
61220	Tool diameter is too small. (Ch《Channel number》《Block number》)
61221	No valid tool. (Ch《Channel number》《Block number》)
61222	Plane feed is bigger than tool diameter. (Ch《Channel number》《Block number》)
61223	Approach pass is too small. (Ch《Channel number》《Block number》)
61224	Retract pass is too small. (Ch《Channel number》《Block number》)
61225	Swivel data record is not found. (Ch《Channel number》《Block number》)
61226	Slant head replacement not possible. (Ch《Channel number》《Block number》)
61230	Tool probe diameter is too small. (Ch《Channel number》《Block number》)
61231	Shop mill program is not executed as it was not tested. (Ch《Channel number》《Block number》)
61232	Magazine tool cannot be loaded. (Ch《Channel number》《Block number》)
61233	Definition of screw angle is invalid. (Ch《Channel number》《Block number》)
61300	Probe defect. (Ch《Channel number》《Block number》)
61301	Probe cannot be changed. (Ch《Channel number》《Block number》)
61302	Probe collision. (Ch《Channel number》《Block number》)
61303	Safe margin was exceeded. (Ch《Channel number》《Block number》)
61304	Tolerance. (Ch《Channel number》《Block number》)
61305	Dimension is too small. (Ch《Channel number》《Block number》)
61306	Measurement difference exceeded permissible range. (Ch《Channel number》《Block number》)
61307	Measurement variant is wrong. (Ch《Channel number》《Block number》)
61308	Check measurement pass 2a. (Ch《Channel number》《Block number》)
61309	Check probe type. (Ch《Channel number》《Block number》)
61310	Scale element is valid. (Ch《Channel number》《Block number》)

61311	D number is invalid. (Ch《Channel number》《Block number》)
61312	Check measurement cycle number. (Ch《Channel number》《Block number》)
61313	Check probe number. (Ch《Channel number》《Block number》)
61314	Check type of selected tool. (Ch《Channel number》《Block number》)
61315	Check position of blace tip. (Ch《Channel number》《Block number》)
61316	Center and radius cannot be determined. (Ch《Channel number》《Block number》)
61317	Check parameter CYCLE116. (Ch《Channel number》《Block number》)
61318	Check gravity factor _K. (Ch《Channel number》《Block number》)
61319	Check calling of parameter CYCLE114. (Ch《Channel number》《Block number》)
61320	Check tool number. (Ch《Channel number》《Block number》)
61321	Check Z0 memory number. (Ch《Channel number》《Block number》)
61322	Check 4th number of _KNUM. (Ch《Channel number》《Block number》)
61323	Check 5th number of _KNUM. (Ch《Channel number》《Block number》)
61324	Check 6th number of _KNUM. (Ch《Channel number》《Block number》)
61325	Check measurement axis/sub measurement axis. (Ch《Channel number》《Block number》)
61326	Check measurement direction. (Ch《Channel number》《Block number》)
61327	Program reset is needed. (Ch《Channel number》《Block number》)
61328	Check D number. (Ch《Channel number》《Block number》)
61329	Check rotating axis. (Ch《Channel number》《Block number》)
61330	Coordinate rotation valid. (Ch《Channel number》《Block number》)
61331	Angle is too wide. Change measurement axis. (Ch《Channel number》《Block number》)
61332	Modification of tool tip position. (Ch《Channel number》《Block number》)
61333	Check calibration function number. (Ch《Channel number》《Block number》)
61334	Check safe zone. (Ch《Channel number》《Block number》)
61336	No geometry axis. (Ch《Channel number》《Block number》)
61337	Check measurement input. (Ch《Channel number》《Block number》)
61338	Positioning speed is 0. (Ch《Channel number》《Block number》)
61339	Modification element of fast feed traverse speed = 0. (Ch《Channel number》《Block number》)
61340	Alarm number is wrong. (Ch《Channel number》《Block number》)
61341	Probe is not calibrated in active plane or feeding axis. (Ch《Channel number》《Block number》)
61342	There is invalid software version or wrong input format in GUD 6. (Ch《Channel number》《Block number》)
61343	No tool with tool ID. (Ch《Channel number》《Block number》)
61344	Plural tools are active. (Ch《Channel number》《Block number》)
61345	Parameterized D number (_KNUM) is too big. (Ch《Channel number》《Block number》)
61346	Distance between starting point and measurement point SETV[0] or SETV[1] <=0. (Ch《Channel number》《Block number》)
61347	Angle between 1st blade and 2nd blade is 0. (Ch《Channel number》《Block number》)
61348	Angle related to reference edge is 0. (Ch《Channel number》《Block number》)
61349	At tool diameter measurement, distance from upper probe edge to measurement point = 0. (Ch《Channel number》《Block number》)
61350	Cutting speed, speed are not programmed in _MFS for tool measurement when spindle is rotating. (Ch《Channel number》《Block number》)
61351	Tool length or diameter is 0. (Ch《Channel number》《Block number》)

61352	Pass of log file is not allowed. (Ch《Channel number》《Block number》)
61353	Pass of log file is not found. (Ch《Channel number》《Block number》)
61354	Log file is not found. (Ch《Channel number》《Block number》)
61355	Log file type is wrong. (Ch《Channel number》《Block number》)
61356	Log file is being used. (Ch《Channel number》《Block number》)
61357	No usable resource. (Ch《Channel number》《Block number》)
61358	Error when recording. (Ch《Channel number》《Block number》)
61359	Reset and continue. (Ch《Channel number》《Block number》)
61360	Log job is not defined - reset and continue. (Ch《Channel number》《Block number》)
61361	Variable cannot be recorded. (Ch《Channel number》《Block number》)
61362	CYCLE118: Set value is too large. (Ch《Channel number》《Block number》)
61363	Record line exceeded maximum lines. (Ch《Channel number》《Block number》)
61364	Check distance from measurement point 1 to measurement point 2. (Ch《Channel number》《Block number》)
61365	Check of circle feeding. (Ch《Channel number》《Block number》)
61366	Rotation direction of tool measurement using rotating spindle is not specified in _CM[5]. (Ch《Channel number》《Block number》)
61367	Parameter _SETV[0...3] or _SETV[...7] is same. (Ch《Channel number》《Block number》)
61368	No intersection on line passing through parameter _SETV[0...3] or _SETV[4...7]. (Ch《Channel number》《Block number》)
61369	Corner position is not clearly defined. Chack parameter (SETV[0...7]). (Ch《Channel number》《Block number》)
61370	No input in _PROTVAL[0]-_PROTVAL[5] within GUD6. (Ch《Channel number》《Block number》)
61371	Multiple of column width and column number exceeded 200 characters/line. (Ch《Channel number》《Block number》)
61401	Probe does not change. Traverse limit from software limit position. (Ch《Channel number》《Block number》)
61402	Probe collision. Traverse limit from software limit position. (Ch《Channel number》《Block number》)
61601	Finishing area diameter is too small. (Ch《Channel number》《Block number》)
61602	Definition of tool width is wrong. (Ch《Channel number》《Block number》)
61603	Definition of recess type is wrong. (Ch《Channel number》《Block number》)
61604	Active tool is violating program contour. (Ch《Channel number》《Block number》)
61605	Contour is not properly programmed. (Ch《Channel number》《Block number》)
61606	Error when preparing contour. (Ch《Channel number》《Block number》)
61607	Starting point is wrongly programmed. (Ch《Channel number》《Block number》)
61608	Tool point direction programmed is worng. (Ch《Channel number》《Block number》)
61609	Definition of shape is wrong. (Ch《Channel number》《Block number》)
61610	Feed dipth is not programmed. (Ch《Channel number》《Block number》)
61611	Intersection is not found. (Ch《Channel number》《Block number》)
61612	Thread cutting finish is impossible. (Ch《Channel number》《Block number》)
61999	General cycle error. (Ch《Channel number》《Block number》)
61701	Error in finish area contour description. (Ch《Channel number》《Block number》)
61702	Error in blank contour description. (Ch《Channel number》《Block number》)

61703	Internal cycle error in file deletion. (Ch《Channel number》《Block number》)
61704	Internal cycle error in file writing. (Ch《Channel number》《Block number》)
61705	Internal cycle error in file reading. (Ch《Channel number》《Block number》)
61706	Internal cycle error in check sum detection.(Ch《Channel number》《Block number》)
61707	Internal cycle error in MMC start. (Ch《Channel number》《Block number》)
61708	Internal cycle error in MMC ready program. (Ch《Channel number》《Block number》)
61709	Time out of contour calculation. (Ch《Channel number》《Block number》)
61710	No stock removal program. (Ch《Channel number》《Block number》)
61711	No stock removal program name. (Ch《Channel number》《Block number》)
61712	Tool parameter of machining direction is not defined. (Ch《Channel number》《Block number》)
61720	Invalid input. (Ch《Channel number》《Block number》)
61721	Contour direction is not found. (Ch《Channel number》《Block number》)
61722	System error. (Ch《Channel number》《Block number》)
61723	Machining impossible. (Ch《Channel number》《Block number》)
61724	Material cannot be used. (Ch《Channel number》《Block number》)
61725	Memory space problem. Error in contour generation. (Ch《Channel number》《Block number》)
61726	Internal error. Memory space problem_FILECTRL_INTERNAL_ERROR (Ch《Channel number》《Block number》)
61727	Internal error. Memory space problem_FILECTRL_INTERNAL_ERROR (Ch《Channel number》《Block number》)
61728	Internal error. Memory space problem_ALLOC_P_INTERNAL_ERROR (Ch《Channel number》《Block number》)
61729	Internal error. Memory space problem_ALLOC_P_INTERNAL_ERROR (Ch《Channel number》《Block number》)
61730	Internal error: Invalid memory. (Ch《Channel number》《Block number》)
61731	Internal error: Exception of floating point. (Ch《Channel number》《Block number》)
61732	Internal error: Invalid command. (Ch《Channel number》《Block number》)
61733	Internal error: Floating point error. (Ch《Channel number》《Block number》)
61734	Cutting edge is different from cutting direction. (Ch《Channel number》《Block number》)
61735	Finishing area is not within blank contour. (Ch《Channel number》《Block number》)
61736	Tool insertion length < machining depth. (Ch《Channel number》《Block number》)
61737	Machining cutting depth < Tool nose diameter. (Ch《Channel number》《Block number》)
61738	Machining cutting depth < Tool nose diameter. (Ch《Channel number》《Block number》)
61739	Tool insertion position is not for this machining. (Ch《Channel number》《Block number》)
61740	Blank must be closed contour. (Ch《Channel number》《Block number》)
61741	Aborted because of memory shortage. (Ch《Channel number》《Block number》)
61742	Approach caused collision. Cannot correct. (Ch《Channel number》《Block number》)
61766	Blank program error. (Ch《Channel number》《Block number》)
61798	Acceptance error active. (Ch《Channel number》《Block number》)
61799	Acceptance error ready program. (Ch《Channel number》《Block number》)
61800	No external CNC system. (Ch《Channel number》《Block number》)
61801	G code selection error. (Ch《Channel number》《Block number》)
61802	Axis type error. (Ch《Channel number》《Block number》)
61803	Program axis cannot be used. (Ch《Channel number》《Block number》)

61804	Program position went beyond reference point. (Ch《Channel number》《Block number》)
61805	Programmed values are absolute and incremental. (Ch《Channel number》《Block number》)
61806	Axis assignment error. (Ch《Channel number》《Block number》)
61807	Programmed spindle direction error (active). (Ch《Channel number》《Block number》)
61808	There is no finish drilling depth or single drilling depth. (Ch《Channel number》《Block number》)
61809	Drilling position is out of possible range. (Ch《Channel number》《Block number》)
61810	ISO G code cannot be used. (Ch《Channel number》《Block number》)
61811	Name of ISO axis is improper. (Ch《Channel number》《Block number》)
61812	External cycle calling value is not properly defined. (Ch《Channel number》《Block number》)
61813	GUD value is not properly defined. (Ch《Channel number》《Block number》)
61814	Channel %1 block %2: polar coordinates not possible with cycle.
61815	Channel %1 block %2: G40 not active.
61816	Channel %1 block %2: Axes not on reference point.
61817	Channel %1 block %2: Axis coordinates within protection zone.
61818	Channel %1 block %2: Axis range limits are equal.
61900	Contour cannot be used. (Ch《Channel number》《Block number》)
61901	Contour is not closed. (Ch《Channel number》《Block number》)
61902	No more usable memory. (Ch《Channel number》《Block number》)
61903	Too many contour elements. (Ch《Channel number》《Block number》)
61904	Too many intersections. (Ch《Channel number》《Block number》)
61905	Cutter radius is too small. (Ch《Channel number》《Block number》)
61906	Too many contours. (Ch《Channel number》《Block number》)
61907	Circle center is not specified. (Ch《Channel number》《Block number》)
61908	Starting point is not specified. (Ch《Channel number》《Block number》)
61909	Herical radius is too small. (Ch《Channel number》《Block number》)
61910	Herical violates contour. (Ch《Channel number》《Block number》)
61911	Several approach points are needed. (Ch《Channel number》《Block number》)
61912	No pass generation. (Ch《Channel number》《Block number》)
61913	Remaining material was not generatged. (Ch《Channel number》《Block number》)
61914	Programmed herical violates contour. (Ch《Channel number》《Block number》)
61915	Approach/retract motion violated contour. (Ch《Channel number》《Block number》)
61916	Ramp pass is too short. (Ch《Channel number》《Block number》)
61917	Overlap of remaining corner is less than 50%. (Ch《Channel number》《Block number》)
61918	Cutter radius for remaining material is too large. (Ch《Channel number》《Block number》)
61980	island contour error. (Ch《Channel number》《Block number》)
61981	Edge contour error. (Ch《Channel number》《Block number》)
61982	Feed width in plane is too large. (Ch《Channel number》《Block number》)
61983	No pocket edge contour. (Ch《Channel number》《Block number》)
61984	Tool parameter_TN is not defined. (Ch《Channel number》《Block number》)
61985	No program name for drill position. (Ch《Channel number》《Block number》)
61986	No program for pocket milling. (Ch《Channel number》《Block number》)
61987	No program for drill position. (Ch《Channel number》《Block number》)
61988	No program name for pocket milling. (Ch《Channel number》《Block number》)
61989	D1 is not programmed as active cutting edge. (Ch《Channel number》《Block number》)

62000	New tool insertion. (Ch《Channel number》《Block number》)
62100	Drilling cycle is not active. (Ch《Channel number》《Block number》)
62101	Milling direction is wrong - G3 is generated. (Ch《Channel number》《Block number》)
62102	Packet area is not completely grooved during finishing. (Ch《Channel number》《Block number》)
62103	Permissible difference of finishing is not programmed. (Ch《Channel number》《Block number》)
62104	Definition of drilling is wrong. (Ch《Channel number》《Block number》)
62105	Number of column or line is zero. (Ch《Channel number》《Block number》)
62200	Spindle start. (Ch《Channel number》《Block number》)
62300	Check number of experience value. (Ch《Channel number》《Block number》)
62303	Safety margin was exceeded. (Ch《Channel number》《Block number》)
62304	Allowance. (Ch《Channel number》《Block number》)
62305	Dimension is too small. (Ch《Channel number》《Block number》)
62306	Measurement difference exceeded permissible range. (Ch《Channel number》《Block number》)
62307	Maximum number of characters per page was exceeded. (Ch《Channel number》《Block number》)
62308	Variable column width is invalid. (Ch《Channel number》《Block number》)
62309	Insufficient column width. (Ch《Channel number》《Block number》)
62310	Number of characters per line is up to 200 characters. (Ch《Channel number》《Block number》)
62311	Adjust maximum number of characters in line _PROTFORM[1]. (Ch《Channel number》《Block number》)
62900	Error in source file. (Ch《Channel number》《Block number》)
62901	Source file cannot be used. (Ch《Channel number》《Block number》)
62902	Not executed yet. (Ch《Channel number》《Block number》)
62903	Error in contour. (Ch《Channel number》《Block number》)
62904	Tree inconsistency. (Ch《Channel number》《Block number》)
62905	Archive inconsistency. (Ch《Channel number》《Block number》)
62906	Error in reading from input file.(Ch《Channel number》《Block number》)
62907	Error in writing to NC file. (Ch《Channel number》《Block number》)
62908	Self cutting contour. (Ch《Channel number》《Block number》)
62909	Internal error: Self contour_part. (Ch《Channel number》《Block number》)
62910	Error in contour orientation calculation. (Ch《Channel number》《Block number》)
62911	Target over-writing error. (Ch《Channel number》《Block number》)
62912	Plane cannot be specified here. (Ch《Channel number》《Block number》)
62913	Inch/metric display is not allowed. (Ch《Channel number》《Block number》)
62914	Vague contour pocket call. (Ch《Channel number》《Block number》)
62915	No contour pocket call. (Ch《Channel number》《Block number》)
62916	Contour is not finished yet. (Ch《Channel number》《Block number》)
62917	End of contour without specifying start. (Ch《Channel number》《Block number》)
62918	Fast forward traverse during contour definition. (Ch《Channel number》《Block number》)
62919	No radius parameter specified. (Ch《Channel number》《Block number》)
62920	Pocket surface is not specified. (Ch《Channel number》《Block number》)
62921	Pocket depth is not specified.(Ch《Channel number》《Block number》)
62922	Output program is not specified. (Ch《Channel number》《Block number》)
62923	Starting point is not specified. (Ch《Channel number》《Block number》)

62924	Too many elements within contour. (Ch《Channel number》《Block number》)
62925	Radius is specified together with center. (Ch《Channel number》《Block number》)
62926	Radius is wrong. (Ch《Channel number》《Block number》)
62927	Error in file. (Ch《Channel number》《Block number》)
62928	Error in chamfering. (Ch《Channel number》《Block number》)
62929	Overlapped pocket. (Ch《Channel number》《Block number》)
62930	Contour is not closed. (Ch《Channel number》《Block number》)
62931	Error in remaining material. (Ch《Channel number》《Block number》)
62932	Error in reading from RIF file. (Ch《Channel number》《Block number》)
62933	Demonstration mode. (Ch《Channel number》《Block number》)
62934	Error in finish contour calculation. (Ch《Channel number》《Block number》)
62999	V05.03.04 30.03.00

1.5 Cycle Alarm (User)

65000	Customer cycle. (User)
66000	Customer cycle. (User)
67000	Customer cycle. (User)
68000	Customer cycle. (User)

65100	There is an error in G10 specification. (N001) Specification is in short. (N002) Specification value is invalid.
65146	Axis specification in machine coordinate selection (G53) is incremental.
65179	There is an error in specification of groove width correction.
65182	There is an error in T specification. (N002) Turret surface number = 0 or turret surface number > Number of turret surfaces. (N003) Tool number = 0 or tool number > number of tool correction set number. (N004) Correction number > tool correction set number. (N005) When correction number ≠ 0, blade tip position = 0 and blade tip R ≠ 0. (N008) Turret number or tool number changed in multiple correction. (N010) Tool type error.
67100	Error occurred in Q setter repeat.
67109	Q setter data are abnormal. (N003) Offset number. (N004) Tool type. (N005) Axis selection signal. (N006) Contact direction.
67114	Blade tip is interlocked in Q setter.
67124	Measurement is not executed at all in Q setter.
67138	Touch signal is not entered in Q setter repeat.
67139	Measurement starting point of Q setter repeat is wrong.
67149	Rotation tool cannot be measured in Q setter repeat.

1.6 Compile Cycle Alarm

70000	Compile cycle alarm.
75000	OEM alarm.

70115	Start-up or cancel of auto nose R correction is specified other than G00, G01.
70117	Over-cutting occurred in auto nose R correction. (#001) Arc radius < tool diameter correction amount. (#002) Other interference.
70118	There is no intersection in auto nose R correction.
70119	Wrong specification during auto nose R correction mode. (#001) Plane change in current block. (#002) Plane change in next block. (#003) Wrong G code in current block. (#004) Wrong G code in next block. (#005) G38 specification other than G00/G01 in current block (offset vector retained). (#006) G38 specification other than G00/G01 in next block (offset vector changed). (#008) Specification of axis in plane by G39 specification in next block (corner arc).
70180	G41 or G42 was specified during G140, G143 mode.
70900	Failed in access to machine data. (#001) Number of axis is less than 0. (#002) Failed in reading.
70901	Failed in access to data. (#001) Failed in acquiring symbol. (#002) Failed in reading. (#003) Failed in writing.

2. MMC 100 ALARMS/MESSAGES

2.1 Basic System

No.	Message	Contents
100300	'xxx' not found.	The search term was not found.
100301	Table cannot completely generated	Not enough memory available to generate the listing.
100302	No data available-or no access right!	Listing could not be generated as the required data were not available at that moment. Example: Local user data not defined.
100303	Paging not possible	It was not possible to page in a listing via, axes, drivers or channels, for example, as no more axes, drives or channels are configured.
100350	Display MD saved	• The display machine data was saved via the softkey "Save" in the operating area start-up, screen machine data - display machine data. • The display data is saved in the start-up basic display by activating the softkey "LED brighter" or "LED darker" (this setting reappears at the next power-up). • In software version 4.1 and higher. If the display options are changed in the machine data screen, the changes are saved in the display machine data which are not visible to the user.
100351	Display MC cannot be accepted	The NCK refused to save the display data.

2.2 Diagnostics

No.	Message	Contents
101000	No connection to PLC!	It was not possible to set up a connection to the PLC during power-up, e.g. incorrect PLC basic program.
101001	PLC system status list cannot be read	The system status list cannot be read after connection setup.
101002	Passwords is not valid!	An incorrect password has been entered.
101003	Passwords set for %1!	The password for system, manufacturer, service or user was not set successfully. %1 = Access level: system, manufacturer, service or user.
101004	Passwords has been changed for %1!	The password for system, manufacturer, service or user was changed. %1 = Access level: system, manufacturer, service or user.
101005	Passwords do not correspond!	On changing the password, the first password entered did not correspond to the second one entered.
101006	Password has been deleted!	The password has been deleted via the softkey Delete password.
101007	Password has not been set!	Higher access rights are needed for deleting the password, at least user.
101008	Current access level: %1	Upon selection of the alarm screen the current access level is output: system, manufacturer, service or user, or keyswitch position 3/2/1/0. %1 = Access level: system, manufacturer, service or user.

101013	Input error - see help - (i) key	PLC status: A syntax error occurred when entering a value in the PLC status. The input syntax is shown in the help screen.
101016	Error:Operand address greater than 65535!!	The operand address value range was exceeded.
101017	No PLC entry forms found	There are no input screenforms *.plc in the target system.
101018	Read-in possible only in active PLC status!	The current mode of the PLC status is not active, e.g. when the softkey "Change" has been activated.
101100	No access rights!	The access level set for displaying the selected window is too low.
101111	No axes configured!	It is not possible to select the "Service axis" or "Axis machine data" screen due to incomplete installation and start-up.
101112	No drives configured!	It is not possible to select the "Service drive" screen due to incomplete installation and start-up.
101113	No channels configured!	It is not possible to select the "Channel machine data" screen due to incomplete installation and start-up.
101114	No MSD configured!	It is not possible to select the "MSD machine data" screen due to incomplete installation and start-up or because the MSD drives do not exist.
101115	No FDD configured!	It is not possible to select the "FDD machine data" screen due to incomplete installation and start-up or because the FDD/SLM drives do not exist.
101130	Error return value not defined: 00h 00h	A function which was called in the start-up area could not be executed due to unknown reasons.
101131	No controller disable on PI Start	-
101132	Impermissible value execution argument	-
101133	MDx120 CURRCTRL_GAIN could not be calculated	-
101134	MDx407 SPEEDCTRL_GAIN_1 could not be calculated	-
101135	MDx409 SPEEDCTRL_ INTEGRATOR_TIME_1 could not be calculated	-
101136	MDx150 FIELDCTRL_GAIN could not be calculated	-
101137	MDx141 MAGNETIZING_ REACTANCE=0	-
101138	MDx139/MDx140 MD_STATOR_/ ROTOR_LEAKAGE_REACTANCE=0	-
101139	MDx134 MOTOR_NOMINAL_ FREQUENCY=0	-
101140	MDx138 ROTOR_COLD_ RESISTANCE=0	-

101141	MDx117 MOTOR_INERTIA=0	-
101142	MDx146<MDx142 MOTOR_MAX_ ALLOWED_SPEED <FIELD_WEAKENING_SPEED	-
101143	MDx142 FIELD_WEAKENING_ SPEED=0	-
101144	MDx118 MOTOR_STANDSTILL_ CURRENT=0	-
101145	MD1104/1118 MOTOR_MAX_ CURRENT/MOTOR__ STANDSTILL_CURRENT>900.0	-
101146	Boot file(s) saved	Saving of boot file in the start-up area, drive machine data screen, was successful.
101147	Boot file(s) deleted	Deleting of boot file in the start-up area, driving machine data screen, was successful.
101148	Controller MD calculated	Calculating of controller data in the start-up area, drive machine data screen, was successful.
101150	MD active set	Activation of the machine data was successful in the start-up area, machine data screens.
101151	Start-up successful	In the start-up area screen NC Start-up, one of the three functions was successfully initiated. • normal NCK reset • reset with default values • software update start
101153	Communication MMC-NCK faulty %1 %2	In the start-up area the softkey "Calculate controller data", for example, was activated. The NCK or drive returns a non-specified error message for this function call. Error diagnostics can be performed by the installation and start-up engineer on the basis of these two hexadecimal values (error class, error code). %1 = Error class %2 = Error code
101154	PI service refused	The current status of NCK/drive does not permit the selected function.
101155	Path %1 does not exist	In a file function, e.g. save boot files, the given path does not exist. %1 = Path name
101156	Function illegal!	The selected function is illegal.
101157	File %1 does not exist	In the Start-up area, the softkey "Delete boot files" was activated for example, although no boot files are available yet. %1 = File name
101158	Function not allowed in the present operating state.	The present drive state does not allow the function.
101159	Remote block in incorrect state	The present drive state does not allow this function.
101160	Date and time of PLC set	The date or time was changed in the PLC status.

101161	The drive is not in cyclic mode!	The installation and start-up was not complete, therefore, the calculate motor data function cannot be selected.
101162	MDx134/MDx400 MOTOR_ NOMINAL_FREQUENCY/MOTOR_ RATED_SPEED illegal	-
101163	MDx132 MOTOR_NOMINAL_ POWER<=0	-
101164	MDx132 MOTOR_NOMINAL_ VOLTAGE<=0	-
101165	MDx103 MOTOR_NOMINAL_ CURRENT<=0	-
101166	MDx129 POWER_FACTOR_COS_ PHI illegal	NCK does not report a faulty block.
101167	MDx134/MDx400 MOTOR_ NOMINAL_FREQUENCY/MOTOR_ RATED_SPEED illegal	-
101168	Warning MDx142 FIELD_ WEAKENING_SPEED<MDx400 MOTOR_RATED_SPEED	-
101200	Safety Integrated data copied	The copy SI data function was successful.
101201	Safety Integrated data confirmed	The confirm SI data function was successful.
101202	SI data are being copied:axis %1, drive %2	This message was output during the copy SI data function. %1 = Axis name %2 = Drive number
101203	SI data not copied completely	An error occurred during the copy SI data function; SI data could not be copied or were not copied completely.
101204	SI data not confirmed	The confirm SI data function was not executed, as an error occurred during processing.
101205	Drive data changed?→Don't forget to save bootfiles!	On exiting the drive machine data screens, the user is reminded to save the bootfiles, to ensure that any changes made to the drive machine data are not lost.
101206	Search operation in progress, please wait...	The search function has been triggered in the machine data screens.
101207	Positioning to $MN_...	A list display, e.g. general machine data was selected. The MMC 100 is attempting to position at the data last selected in this display.
101208	Confirming SI data:axis 1	The Safety integrated confirm function was started in the start-up area. The message is output during this function to provide the user with feedback on the execution of the function.
101209	Confirming SI data:drive 1	The safety integrated confirm function was started in the start-up area. The message is output during this function to provide the user with feedback on the execution of the function.
101210	Preparing machine data for display...	A list display for which display options are active was selected in the machine data. The machine data of this display are checked individually to determine whether they can be displayed.

101211	Address of NCK not changed!	An attempt was made to change the bus address of the NCK in the start-up area. The modification was denied by the NCLK. The reason is unknown.
101212	Address of NCK changed	The bus address of the NCK was set to the value entered.
101213	Invalid NCK address!	The value entered for the new bus address of the NCK is too large.
101214	Initialization of this window failed	An attempt was made to select the NCK address display in the start-up area. An error occurred during detection of the nodes on the bus. The display could not be visualized because of inconsistent data.
101300	Please wait-switching language	The language selection softkey was activated in the start-up area. The screen contents are being refreshed.

2.3 Machine

No.	Message	Contents
103000	No correction block in the NCK	NCK does not report a faulty block.
103001	Select possible only after enable or in RESET state	In order to execute the desired function, the current channel must be in the Reset state, e.g. program selection.
103002	You cannot copy into the clipboard	NCK cannot copy into the clipboard, because, for example, there is not enough memory space available or the maximum possible number of programs it can manage has been exceeded.
103003	You cannot delete the MDA buffer	NCK cannot delete the buffer because it is being processed.
103004	Block search not possible	Search function cannot be run because the channel is active.
103006	Block search without calculation only possible on main program level	It is not possible to process subroutine calls with block search without calculation.
103007	terminate overstore is not possible in channel state	It is not possible to terminate overstore, because the channel is still active.
103008	Block search started in channel %1 - Please wait!	The started block search is not yet completed. %1 = Channel number
103009	Conflict between search type and search target!	The entered search target does not match the search type: • Block number start character 'N' or ':' is missing. • Only numbers between 0 and 9 are allowed.
103010	Invalid file name	The entered file name • May be up to 32 characters long (letters, numbers, underscore; including the block and program identifiers: _N_and_MPF), corresponds to 25 characters that can be used. • Must not contain separators (e.g./). • Must contain letters at the first and second position.
103011	No program selected - block search terminated	A block search is not possible as currently there is no program selected.
103014	Please reference axis first	Reference point approach has not been performed yet or terminated.

2.4 Parameters

No.	Message	Contents
104000	Current tool not found	If the cursor is positioned on an empty line in the 'Magazine list window, this means that no tool was found on activation of the 'Tool data' softkey.
104001	No additional tools available	Upon activation of the 'T no. +' or 'T no. -' softkey, a search is performed for the next highest or next lowest tool number. This message is output if no additional tools are available.
104002	No additional tool edges available	Upon activation of the 'D no. +' or 'D no. -' softkey, a search is performed for the next highest or next lowest tool edge. This message is output if no additional tool edges are available.
104003	There are no tools at all	No tools were set up.
104004	No current tool available	Upon activation of the 'Current T+D no.' softkey in the 'Overview of tools' window, no tool was found. This is because no part program is active or no tool is selected in the active part program.
104005	No current tool edge available	Although a current tool is available, there is no current tool edge.
104006	No TO area available in current channel	There is no TO area assigned to the current channel.
104007	Error on creating tool.	Tool could not be created, for example, because the maximum number of possible tools has already been reached.
104008	Error on creating tool edge	A new tool edge could not be created, for example, because the maximum number of all of the tool edges has already been reached.
104011	Error on creating tool.	The tool cannot be deleted, it is possibly currently active.
104012	No master spindle available	No master spindle has been configured.
104014	Incorrect input	The value entered is not permissible, for example, it is outside the input limits.
104015	Number of parameters per tool edge is zero	The number of parameters per tool edge was not configured.
104016	No spindles available	No spindle has been configured.
104018	Tool not available.	The specified tool does not exist.
104019	Tool type not available	The specified tool type does not exist.
104020	No empty location found	There is no empty location with the specified search parameters.
104023	Error on loading tool	An error occurred while loading a tool; the operation was aborted.
104024	Error on unloading tools	An error occurred while unloading a tool; the operation was aborted.
104025	No magazine configured	No magazine has been configured.
104026	Caution:Tool Load running!	Referring to load procedure.
104027	Caution:Tool Unload running!	Referring to unload procedure.
104029	Not possible to load at this location	The location may already be occupied.
104030	No further data available	All available data have already been displayed.

2.5 Programming

No.	Message	Contents
105000	error x y	Internal system error. A memory access has failed. This should not occur during normal operation.
105001	Cycle description sc.com does not exist	The cycle description sc.com was not found in the NCK file system.
105002	File xxx already exists	The file name entered already exists in this directory.
105003	Workpiece xxx already exists	The workpiece name entered already exists in this directory.
105004	Paste buffer is empty! COPY first before PASTE	A file could not be inserted because no file was first copied into the paste buffer.
105005	Only workpieces can be inserted here	The file type of the copied file is not _wpd and cannot be inserted into the workpiece directory.
105006	Only files can be inserted here	A file with the file type _wpd, i.e. workpiece, was copied, and an attempt was made to insert it in a program directory.
105007	No name specified	-
105008	Memory error on writing cycle call	The resources of the MMC100 are exhausted. No more dynamic memory is available.
105009	No write access to data	The file is write-protected.
105010	No data selected	The cursor is not positioned on a valid file name.
105011	Cycles overview cov.com does not exist	The cycle overview cov.com. was not found in the NCK file system.
105012	Program not editable or only partially editable (NC reset)	The selected program is currently being executed.
105013	Copied data can be inserted with “Paste” softkey	The copied data are stored in the Clipboard and can be inserted again by pressing the 'Paste' softkey.
105014	Error on copying!	The file could not be copied.
105015	Error on renaming!	The file could not be renamed.
105016	Error on deleting!	The file could not be deleted.
105017	Select possible only after enable or in RESET state	The selected program is either running or has not yet been released.
105018	Error on creating program!	The program could not be created; a possible cause is that not enough memory is available.
105019	Error on opening window!	The window could not be opened. This is system error which should not occur during normal operation.
105020	Error on closing window!	The window could not be closed. This is a system error which should not occur during normal operation.
105021	Error on creating workpiece!	The workpiece could not be created.
105022	Error on releasing!	The program could not be released.
105023	File already exists!	The file cannot be copied to this directory, because a file of the same name is already stored there.
105024	Check values!! -At least 1 value outside the input limits!	An invalid value was entered in the cycle parameter display.

105025	Please wait preparing directory!	The data required for display of the directory are being retrieved.
105026	Caution!Simulated and edited program are nor the same!	The program which is running is not identical to the program open in the editor.
105030	Please wait, renumbering!	The blocks of the NC program are being numbered.
105031	Renumbering canceled!	Renumbering of the NC program was canceled. A possible cause is that not enough NC program memory is available.
105032	Renumbering completed!	Renumbering of the NC program was completed without an error.
105041	Block number too large!	The increment setting and the size of the program have caused the block numbering to exceed 999999.
105042	Block number not allowed!	The first block number is less than 0 or greater than 999999.
105043	Increment not allowed!	A negative increment was entered.
105050	Please wait:graphic being output!	The help screens are being prepared for display.
105051		Here, the dynamic long texts for cycle configuration are being output.
105052	Error in cycle description of <xxx>!	Cycle description sc.com, uc.com contains a line which cannot be interpreted.
105053	No cycle exists in current line!	The cursor of the editor is positioned in a line which does not contain a cycle. Decompilation is not possible.
105054	Error on calling cycle description!	One of the cycle description files sc.com. or cov.com contains a parameter which cannot be interpreted. The initialization of the cycles is canceled.
105060	Please wait:initializing cycle support	The cycle description files are being interpreted and prepared for display on the screen.
105061	Error on opening file!	The specified file could not be opened. This is an internal system error which should not occur during normal operation.
105062	Error on closing file!	The specified file could not be closed. This is an internal system error which should not occur during normal operation.
105063	Error on positioning in file %1!	The positioning operation could not be performed in the specified file. This is an internal system error which should not occur during normal operation.
105064	Error on reading file!	The specified file could not be read. This is an internal system error which should not occur during normal operation.
105070	Please wait:initialization of simulation started!	The graphical traversing path display is being initialized.

2.6 MMC102/103 Messages

No.	Alarm	Contents
120000	Area %1 cannot be loaded! Acknowledge alarm, press area switchover key!	An application entered in the REGIE.INI could not be started. %1 = Control area name
120001	Area %1 cannot be selected. Please deactivate area %2.	With regard to area switchover, another area must be terminated (unloaded). The area refuses this. Area switchover is not performed. %1 = Control area name %2 = Control area name
120002	Area %1 is still active. Please deactivate area %1.	An area must be terminated before closing the MMC system (closing of master control). The area refuses this. The system is NOT terminated. %1 = Control area name
120003	Area %1 cannot be deactivated. Please try again.	With regard to area switchover, an area must be deselected. The area refuses this. Area switchover is not performed. %1 - Control area name
120005	Please acknowledge the dialog box in area %1.	The area %1 could not be deselected since a dialog box is still open in this area. %1 = Control area name
120006	At present, channel switchover is disabled by area %1.	At present, area %1 has disabled channel switchover since it is performing a critical operation (e.g. processing of external etc.) during which no channel switchover may be performed. %1 = Control area name
120007	At present, channel switchover is disabled.	At present, channel switchover is disabled since a critical operation is being performed during which no channel switchover may be performed.
120120	Alarm list is full.	Pending alarms/messages could not be entered in the alarm list due to missing space. The alarm cannot be cleared since this would lead to permanent inconsistency of the alarm list.
	Alarm texts: Number of alarm texts too high.	At present, the number of alarm texts is limited to 5000. This limit has been exceeded by alarm text configuring.
	!Alarm texts: File %1 not found. Alarm texts: Input/output error in file %1. Alarm texts: Input/output error. Alarm texts: Error when reading from index file. Alarm texts: Error when writing in index file. Alarm texts: Syntax error in alarm text file %1.	Alarm texts are stored in files. Access to one of these files could not be made correctly.
120200	Image processing suppressed.	Due to processing of a part program, the control is loaded so highly that it cannot keep all display values up-to-date.

120201	Communication interrupted.	The operator panel is connected with the NC and PLC via a serial bus. This alarm occurs if the communication to these components is faulty. Together with this alarm, all display values connected with NC/PLC become invalid. Such malfunctions are normal during startup of the controls (e.g. after reset).
120202	Waiting for connection to NC.	The operator panel is connected to the NC and PLC via a serial bus. This alarm occurs when the MMC is started up for the first time if the NC/PLC power-up is not yet complete, or if an error occurs during communication between these components. All display values associated with the NC/PLC are rendered invalid by this alarm, Such malfunctions are normal during startup of the controls (e.g. after reset).

3. DRIVE ALARM

3.1 Messages

300000	Hardware not found: DCM drive bus ASIC.
300001	Axis《NC axis number》drive《Drive number》not allowed.
300002	Axis《NC axis number》drive《Drive number》assigned twice.
300003	Axis《NC axis number》drive《Drive number》module type found differs from configured type《Incorrect module type》.
300004	Axis《NC axis number》drive《Drive number》drive type found (VSA/HSA) differs from configured type《Drive type code》.
300005	At least one module《Module number》found on drive bus has not been configured.
300006	At least one configured module《Module/drive number》has not been found on drive bus.
300007	Axis《NC axis number》drive《Drive number》not configured or inactive.
300008	Axis《NC axis number》drive《Drive number》encoder《Measuring circuit number》is not available.
300009	Axis《NC axis number》drive《Drive number》encoder《Measuring circuit number》configured encoder type differs from type found (《Measuring circuit number》).
300010	Axis《NC axis number》drive《Drive number》active without NC axis assignment.
300011	Axis《NC axis number》drive《Drive number》hardware version of spindle not supported.
300012	Axis《NC axis number》drive《Drive number》hardware version of control module not supported.
300100	Drive power failure.
300101	Drive power missing.
300200	Drive bus hardware fault.
300201	Axis《NC axis number》drive《Drive number》timeout during bus access, error code《Error code》.
300202	Axis《NC axis number》drive《Drive number》CRC error, error code《Error code》.
300300	Axis《NC axis number》drive《Drive number》boot error, error code《Error code》.
300400	Axis《NC axis number》drive《Drive number》system error, error codes《Error code 1》,《Error code 2》.
300401	Software for drive type《Drive type》, block《Block number》missing or defective.
300402	System error in drive interface, error codes《Error code 1》,《Error code 2》.
300403	Axis《NC axis number》drive《Drive number》version number unmatched of drive software and machine data.
300404	Axis《NC axis number》drive《Drive number》machine data file contains unmatched drive no.
300405	Axis《NC axis number》drive《Drive number》unknown drive alarm, code《Service number》.
300410	Axis《NC axis number》drive《Drive number》data file could not be stored (《Error code 1》,《Error code 2》).
300411	Axis《NC axis number》drive《Drive number》data file could not be read (《Error code 1》,《Error code 2》).
300412	Data file could not be stored (《Error code 1》,《Error code 2》).
300413	Data file could not be read (《Error code 1》,《Error code 2》).
300423	Trace results could not be read (《Error code》).
300500	Axis《NC axis number》drive《Drive number》system error, error codes《Error code 1》,《Error code 2》.
300501	Axis《NC axis number》drive《Drive number》maximum current monitoring limit exceeded.

300502	Axis《NC axis number》drive《Drive number》maximum current monitoring limit exceeded in phase current R.
300503	Axis《NC axis number》drive《Drive number》maximum current monitoring limit exceeded in phase current R.
300504	Axis《NC axis number》drive《Drive number》fault of motor transducer.
300505	Axis《NC axis number》drive《Drive number》measuring system error in absolute track, code《Fine error code》.
300506	Axis《NC axis number》drive《Drive number》NC sign-of-life of NC missing.
300507	Axis《NC axis number》drive《Drive number》synchronization error of rotor position.
300508	Axis《NC axis number》drive《Drive number》zero mark monitoring of motor measuring system.
300509	Axis《NC axis number》drive《Drive number》current frequency exceeded.
300510	Axis《NC axis number》drive《Drive number》error on actual current measurement zero balancing.
300511	Axis《NC axis number》drive《Drive number》measuring function active.
300515	Axis《NC axis number》drive《Drive number》power section heatsink temperature exceeded.
300606	Axis《NC axis number》drive《Drive number》flux controller at limit.
300607	Axis《NC axis number》drive《Drive number》current controller at limit.
300608	Axis《NC axis number》drive《Drive number》speed controller at limit.
300609	Axis《NC axis number》drive《Drive number》encoder cut-off frequency exceeded.
300610	Axis《NC axis number》drive《Drive number》rotor position identification failed.
300611	Axis《NC axis number》drive《Drive number》illegal motion during rotor position identification.
300612	Axis《NC axis number》drive《Drive number》impermissible current during rotor position identification.
300613	Axis《NC axis number》drive《Drive number》maximum permissible motor temperature exceeded.
300614	Axis《NC axis number》drive《Drive number》motor temperature time-out.
300701	Axis《NC axis number》drive《Drive number》needs setup.
300702	Axis《NC axis number》drive《Drive number》base cycle time invalid.
300703	Axis《NC axis number》drive《Drive number》cycle time of current control invalid.
300704	Axis《NC axis number》drive《Drive number》cycle time of speed control invalid.
300705	Axis《NC axis number》drive《Drive number》cycle time of position control invalid.
300706	Axis《NC axis number》drive《Drive number》cycle time for monitoring invalid.
300707	Axis《NC axis number》drive《Drive number》basic cycle times of axes differ.
300708	Axis《NC axis number》drive《Drive number》current control cycle times of axes differ.
300709	Axis《NC axis number》drive《Drive number》speed control cycle times of axes differ.
300710	Axis《NC axis number》drive《Drive number》position control cycle times of axes differ.
300711	Axis《NC axis number》drive《Drive number》monitoring cycle times of axes differ.
300712	Axis《NC axis number》drive《Drive number》configuration of controller structure not possible (higher dynamic response).
300713	Axis《NC axis number》drive《Drive number》lead time for position control invalid.
300714	Axis《NC axis number》drive《Drive number》ID code of power section invalid.
300715	Axis《NC axis number》drive《Drive number》maximum current of power section current less than or equal to zero.
300716	Axis《NC axis number》drive《Drive number》constant of torque less than or equal to zero.
300717	Axis《NC axis number》drive《Drive number》motor moment of inertia less than or equal to zero.

300718	Axis《NC axis number》drive《Drive number》calculation dead time of current control less than or equal to zero.
300719	Axis《NC axis number》drive《Drive number》motor not configured for delta connection.
300720	Axis《NC axis number》drive《Drive number》maximum motor speed invalid.
300721	Axis《NC axis number》drive《Drive number》zero-load current exceeds rated current of motor.
300722	Axis《NC axis number》drive《Drive number》zero-load current exceeds rated current of power.
300723	Axis《NC axis number》drive《Drive number》STS configuration of axes differ.
300724	Axis《NC axis number》drive《Drive number》number of pole pairs invalid.
300725	Axis《NC axis number》drive《Drive number》encoder resolution invalid.
300726	Axis《NC axis number》drive《Drive number》voltage constant is zero.
300727	Axis《NC axis number》drive《Drive number》reactance is less than or equal to zero.
300728	Axis《NC axis number》drive《Drive number》adaptation factor torque/current too high.
300729	Axis《NC axis number》drive《Drive number》zero-speed current of motor less than or equal to zero.
300730	Axis《NC axis number》drive《Drive number》rotor resistance invalid.
300731	Axis《NC axis number》drive《Drive number》rated power less than or equal to zero.
300732	Axis《NC axis number》drive《Drive number》rated speed less than or equal to zero.
300733	Axis《NC axis number》drive《Drive number》zero-load voltage invalid.
300734	Axis《NC axis number》drive《Drive number》zero-load current less than or equal to zero.
300735	Axis《NC axis number》drive《Drive number》field weakening speed invalid.
300736	Axis《NC axis number》drive《Drive number》Lh characteristic invalid.
300737	Axis《NC axis number》drive《Drive number》configuration of two EnDat encoders not possible.
300738	Axis《NC axis number》drive《Drive number》encoder module number not possible.
300739	Axis《NC axis number》drive《Drive number》encoder already used as motor measuring system.
300740	Axis《NC axis number》drive《Drive number》encoder multiple used.
300741	Axis《NC axis number》drive《Drive number》asynchronous mode: gain of feedforward control out of range.
300742	Axis《NC axis number》drive《Drive number》voltage/frequency mode: converter frequency invalid value.
300743	Axis《NC axis number》drive《Drive number》function not supported on this 611D module.
300744	Axis《NC axis number》drive《Drive number》safety data checksum invalid. Please confirm and re-test safety functions.
300745	Axis《NC axis number》drive《Drive number》limits for safe positions exchanged.
300746	Axis《NC axis number》drive《Drive number》SS/SV not enabled.
300747	Axis《NC axis number》drive《Drive number》safety cycle time MD 1300 invalid.
300748	Axis《NC axis number》drive《Drive number》safety cycle times of axes differ.
300749	Axis《NC axis number》drive《Drive number》factor between motor and load too big.
300750	Axis《NC axis number》drive《Drive number》configuration of speed control adaptation invalid.
300751	Axis《NC axis number》drive《Drive number》gain of speed control too high.
300752	Axis《NC axis number》drive《Drive number》blocking frequency of setpoint current filter too high.
300754	Axis《NC axis number》drive《Drive number》signal number of var. signaling function invalid.
300755	Axis《NC axis number》drive《Drive number》voltage/frequency mode: motor is turning.

300756	Axis《NC axis number》drive《Drive number》speed hysteresis of setpoint current smoothing invalid.
300757	Axis《NC axis number》drive《Drive number》adaptation factor of torque limit invalid.
300758	Axis《NC axis number》drive《Drive number》generator mode: response voltage exceeds switch-off threshold.
300759	Axis《NC axis number》drive《Drive number》generator mode: response voltage exceeds monitoring threshold.
300760	Axis《NC axis number》drive《Drive number》generator mode: emergency retraction speed exceed maximum motor speed.
300761	Axis《NC axis number》drive《Drive number》generator mode: minimum axis speed exceeds maximum motor speed.
300762	Axis《NC axis number》drive《Drive number》emergency retraction mode/generator mode already active.
300763	Axis《NC axis number》drive《Drive number》emergency retraction mode/generator mode invalid.
300764	Axis《NC axis number》drive《Drive number》emergency retraction mode/generator mode not possible.
300765	Axis《NC axis number》drive《Drive number》measurement of DC link voltage not possible.
300766	Axis《NC axis number》drive《Drive number》blocking frequency > Shannon frequency.
300767	Axis《NC axis number》drive《Drive number》natural frequency > Shannon frequency.
300768	Axis《NC axis number》drive《Drive number》bandwidth numerator > double the blocking frequency.
300769	Axis《NC axis number》drive《Drive number》bandwidth denominator > double the natural frequency.
300770	Axis《NC axis number》drive《Drive number》format error.
300771	Axis《NC axis number》drive《Drive number》asynchronous mode: converter frequency invalid value.
300772	Axis《NC axis number》drive《Drive number》asynchronous mode: gain of speed control too high.
300773	Axis《NC axis number》drive《Drive number》asynchronous mode: configuration of feedforward control structure not possible.
300774	Axis《NC axis number》drive《Drive number》asynchronous mode: changeover speed invalid value.
300775	Axis《NC axis number》drive《Drive number》fixed link voltage of axes differ.
300776	Axis《NC axis number》drive《Drive number》encoder signal monitoring must be active.
300777	Axis《NC axis number》drive《Drive number》rotor position identification current invalid value.
300778	Axis《NC axis number》drive《Drive number》rotor position identification converter frequency invalid value.
300779	Axis《NC axis number》drive《Drive number》motor moment of inertia less than or equal to zero.
300780	Axis《NC axis number》drive《Drive number》zero-load current exceeds rated current of motor.
300781	Axis《NC axis number》drive《Drive number》zero-load current exceeds rated current of power section.
300782	Axis《NC axis number》drive《Drive number》reactance is less than or equal to zero.
300783	Axis《NC axis number》drive《Drive number》rotor resistance invalid.
300784	Axis《NC axis number》drive《Drive number》zero-load voltage invalid.

300785	Axis《NC axis number》drive《Drive number》zero-load current less than or equal to zero.
300786	Axis《NC axis number》drive《Drive number》field weakening speed invalid.
300787	Axis《NC axis number》drive《Drive number》asynchronous mode: gain of feedforward control out of range.
300788	Axis《NC axis number》drive《Drive number》configuration error of parameter in current control adaptation.
300799	Axis《NC axis number》drive《Drive number》data backup and reboot required.
300850	Axis《NC axis number》drive《Drive number》configuration of speed control adaptation invalid.
300854	Axis《NC axis number》drive《Drive number》signal number of var. signaling function invalid.
300855	Axis《NC axis number》drive《Drive number》voltage/frequency mode: motor is turning.
300858	Axis《NC axis number》drive《Drive number》generator mode: response voltage exceeds switch-off threshold.
300859	Axis《NC axis number》drive《Drive number》generator mode: response voltage exceeds monitoring threshold.
300860	Axis《NC axis number》drive《Drive number》generator mode: emergency retraction speed exceeds maximum motor speed.
300861	Axis《NC axis number》drive《Drive number》generator mode: minimum axis speed exceeds maximum motor speed.
300862	Axis《NC axis number》drive《Drive number》emergency retraction mode/generator mode already active.
300863	Axis《NC axis number》drive《Drive number》emergency retraction mode/generator mode invalid.
300864	Axis《NC axis number》drive《Drive number》emergency retraction mode/generator mode not possible.
300865	Axis《NC axis number》drive《Drive number》measurement of DC link voltage not possible.
300875	Axis《NC axis number》drive《Drive number》fixed link voltage of axes differ.
300888	Axis《NC axis number》drive《Drive number》configuration error of parameter in speed control adaptation.
300900	Axis《NC axis number》drive《Drive number》stop A triggered.
300901	Axis《NC axis number》drive《Drive number》stop B triggered.
300906	Axis《NC axis number》drive《Drive number》safe stopping monitoring.
300907	Axis《NC axis number》drive《Drive number》safe standstill monitoring.
300908	Axis《NC axis number》drive《Drive number》stop C triggered.
300909	Axis《NC axis number》drive《Drive number》stop D triggered.
300910	Axis《NC axis number》drive《Drive number》stop E triggered.
300911	Axis《NC axis number》drive《Drive number》erro in cross check.
300914	Axis《NC axis number》drive《Drive number》safe velocity monitoring.
300915	Axis《NC axis number》drive《Drive number》safe position monitoring.
300950	Axis《NC axis number》drive《Drive number》is not safely referenced.
300951	Axis《NC axis number》drive《Drive number》stop test is running.
301701	Axis《NC axis number》drive《Drive number》limit for safe velocity too large.
301702	Axis《NC axis number》drive《Drive number》wrong inversion of actual value.
301703	Axis《NC axis number》drive《Drive number》measurement system and category of motor are not compatible.

301704	Axis《NC axis number》drive《Drive number》division of linear scale and pole pair pitch not compatible.
301705	Axis《NC axis number》drive《Drive number》machine data for scale with position coded reference marks are faulty.
301706	Axis《NC axis number》drive《Drive number》safe cam position invalid.
301707	Axis《NC axis number》drive《Drive number》modulo value for safe cam invalid.
301708	Axis《NC axis number》drive《Drive number》actual value synchronization not permitted.
301709	Axis《NC axis number》drive《Drive number》submodule with integrated linearization invalid.
310505	Axis《NC axis number》drive《Drive number》measuring system error in absolute track, code《Fine error coding》.
310607	Axis《NC axis number》drive《Drive number》valve not responding.
310608	Axis《NC axis number》drive《Drive number》speed controller at limit.
310609	Axis《NC axis number》drive《Drive number》encoder cut-off frequency exceeded.
310611	Axis《NC axis number》drive《Drive number》pressure sensor failed.
310612	Axis《NC axis number》drive《Drive number》force limitation off.
310701	Axis《NC axis number》drive《Drive number》cycle time of speed control invalid.
310702	Axis《NC axis number》drive《Drive number》cycle time of position control invalid.
310703	Axis《NC axis number》drive《Drive number》cycle time for monitoring invalid.
310704	Axis《NC axis number》drive《Drive number》speed control cycle times of axes differ.
310705	Axis《NC axis number》drive《Drive number》monitoring cycle times of axes differ.
310706	Axis《NC axis number》drive《Drive number》maximum working speed invalid.
310707	Axis《NC axis number》drive《Drive number》STS configurations of axes differ.
310708	Axis《NC axis number》drive《Drive number》encoder resolution of motor measuring system invalid.
310709	Axis《NC axis number》drive《Drive number》error in piston rod or piston rod diameter.
310710	Axis《NC axis number》drive《Drive number》machine data for scale with position coded reference marks are faulty.
310750	Axis《NC axis number》drive《Drive number》feedforward control gain too high.
310751	Axis《NC axis number》drive《Drive number》proportional gain for speed controller too high.
310752	Axis《NC axis number》drive《Drive number》integral gain for speed controller invalid.
310753	Axis《NC axis number》drive《Drive number》D component component for speed controller invalid.
310754	Axis《NC axis number》drive《Drive number》gradient of friction compensation too high.
310755	Axis《NC axis number》drive《Drive number》surface adaption too large.
310756	Axis《NC axis number》drive《Drive number》controlled system gain is less than or equal to zero.
310757	Axis《NC axis number》drive《Drive number》blocking frequency > Shannon frequency.
310758	Axis《NC axis number》drive《Drive number》natural frequency > Shannon frequency.
310759	Axis《NC axis number》drive《Drive number》bandwidth numerator is greater than double the blocking frequency.
310760	Axis《NC axis number》drive《Drive number》bandwidth denominator is greater than double the natural frequency.

If warnings or alarms happen in the drive, they are displayed in the alarm screen as follows.

380500 [axis] error code [drive code] value 0 time [o-time]

[axis] : Axis name

[drive code] : Alarm code or warning code in the drive.

[o-time] : Time stamp when the alarm or warning has happened.
(Time lapsed since power was entered)

Example: If alarm 41 occurs in X1 axis, then alarm 255 occurs in Y1 axis;

380500 X1 error code 41 value 0 time 524112

380500 Y1 error code 255 value 0 time 524130

(Note) 1. 380500 is the number indicating the alarm in the drive.

2. The number after the value is 0 fixed.

The [drive code] list is shown in the following pages.

3.2 Servo Pack [Drive Code] List

No.	Alarm	Contents
2	Parameter destroyed/flash memory abnormal	Servo pack EEPROM data are abnormal (parameter destroyed). Flash memory ROM check is abnormal (flash memory is abnormal).
4	Parameter setting abnormal	User constant value is out of the setting range.
5	Combination error	Combination capacity of motor and servo pack is inapplicable.
6	DPRAM error	Data sum check.
16	Over-current	Over-current flow in IGBT.
20	Motor over-current	Current significantly over rated value flowed into the motor.
32	Fuse melted	The fuse melted down.
33	MC operation fault	Magnetic contactor does not work.
34	Generative over-load	Generative energy exceeds the capacity of generative resistance.
36	Converter generative over-current	Over-current flowed into the generative circuit.
64	Over-voltage/converter over-voltage	Main circuit DC voltage is abnormally high (over-voltage). Main circuit DC voltage is abnormally high (converter over-voltage).
65	Short voltage/converter short voltage	Main circuit DC voltage goes down (short voltage). Main circuit DC voltage goes down (converter short voltage).
66	Initial charge abnormal	Charging of main circuit condenser does not complete in the set time.
67	Control circuit low voltage	Control circuit voltage goes down.
81	Over-speed	Motor speed is abnormally high.
113	Over-load (momentary max. load)	Operated with the torque significantly over the rated value for several or several ten seconds.
114	Over-load (continuous max. load)	Continuously operated with the torque over the rated value.
115	DB over-load	In DB (dynamic brake) operation, generative energy exceeds the capacity of DB resistance.
117	Control panel temperature increase	Temperature in the control panel increases.
122	Heat sink over-heat/heat sink thermistor disconnection	Heat sink of the servo pack is over-heated (heat sink over-heat). Thermistor to detect heat sink temperature is disconnected (heat sink thermistor disconnection).
129	Encoder back-up alarm	Encoder currents all go down and position data is cleared.
130	Encoder sum check alarm	"Sum check" result of encoder memory is abnormal.
131	Encoder battery alarm	Voltage of the battery to back up the absolute encoder goes down.
132	Encoder data alarm	Encoder internal data are abnormal.
133	Encoder over-speed	When power is entered, encoder is running at high speed.
134	Encoder over-heat	Internal air temperature of the encoder is too high.
179	Current detect A/D converter abnormal	A/D converter to detect current is abnormal.

182	Communication hardware abnormal	Hardware controlling communication between NC and drive is abnormal.
189	Converter system error	Hardware of the converter is abnormal.
191	System error	Hardware of the servo driver is abnormal.
193	Crash prevention detect	Servo motor is crashing.
198	FPG disconnection (PA,PB)	A,B phase signal line of the external encoder is disconnected.
199	FPG disconnection (PC)	C phase signal line of the external encoder is disconnected.
200	Encoder clear abnormal	Multi-revolution of the absolute encoder is not properly cleared.
201	Encoder communication abnormal	Communication between encoder and servo pack is not possible.
202	Encoder parameter abnormal	Parameter of the encoder is destroyed.
203	Encoder echo-back abnormal	Contents of communication with the encoder are wrong.
204	Multi-turn limit value disagree	The multi-return limit values of the encoder and servo pack do not agree.
206	FPG multi-turn abnormal	Multi-turn data of the external encoder are abnormal.
208	Position deviation too large	Position deviation pulse exceeds the set value of user constant (Cn3158).
225	Time-out error	After power is on, communication between NC - drive is not possible.
226	Converter WDC abnormal	Synchronization between converter - drive is out of order.
227	Converter data abnormal	Data between converter - drive are abnormal.
229	Network communication abnormal	No acknowledgement comes from NC.
230	Link setting error	Settings of NC and drive are different.
234	Drive initial access error	When power is entered, communication between converter - drive is not possible.
236	Drive WDC abnormal	No acknowledgement comes from the drive.
242	Power source frequency deviation too large	Power source frequency is abnormal.

No.	Warning	Contents
145	Over-load warning	If current operation is continued, there may be an over-load alarm.
147	Battery warning	Battery voltage is decreasing.
151	Heat sink over-heat	If current operation is continued, there may be a heat sink over-heat alarm.

(Note) Monitor operation is continued under warning state.

3.3 Inverter [Drive Code] List

No.	Alarm	Contents
2	Parameter destroyed/flash memory abnormal	Servo pack EEPROM data are abnormal (parameter destroyed). Flash memory ROM check is abnormal (flash memory is abnormal).
4	Parameter setting abnormal	User constant value is out of the setting range.
6	DPRAM error	Data sum check.
16	Over-current	Over-current flows in IGBT.
32	Fuse melted	The fuse melted down.
33	MC operation fault	Magnetic contactor does not work.
50	Generative over-load	Generative energy exceeds the capacity of generative resistance.
52	Converter generative over-current	Over-current flowed into the generative circuit.
64	Over-voltage/converter over-voltage	Main circuit DC voltage is abnormally high (over-voltage). Main circuit DC voltage is abnormally high (converter over-voltage).
65	Short voltage/converter short voltage	Main circuit DC voltage goes down (short voltage). Main circuit DC voltage goes down (converter short voltage).
66	Initial charge abnormal	Charging of main circuit condenser does not complete in the set time.
67	Control circuit low voltage	Control circuit voltage goes down.
82	Over-speed (motor side)	Motor speed is abnormally high.
	Over-speed (machine side)	Spindle speed is abnormally high.
83	Speed deviation too large	Speed deviation is abnormally high.
84	Over-speed (Low speed winding motor side)	Motor speed for slow winding is abnormally high.
85	Over-speed (C axis)	Motor speed for C axis control is abnormally high.
105	Winding change action fault.	Operation of the winding change contacter is faulty.
107	Emergency stop action fault	Emergency stop is not properly performed.
113	Over-load (momentary max. load)	Operated with the torque significantly over the rated value for several or several ten seconds.
117	Internal cooling FAN abnormal/ control panel temperature increase	Internal cooling FAN is not properly working (internal cooling FAN abnormal). Temperature in the control panel increased.
121	Motor over-heat/motor thermistor disconnection.	Motor temperature increased abnormally (motor over-heat). Thermistor of the motor is disconnected (motor thermistor disconnection).
122	Heat sink over-heat/heat sink thermistor disconnection	Heat sink of the servo pack is over-heated (heat sink over-heat). Thermistor to detect heat sink temperature is disconnected (heat sink thermistor disconnection).
178	CPU built-in A/D converter abnormal	A/D converter installed in CPU is abnormal.
179	Current detect A/D converter abnormal	A/D converter to detect current is abnormal.

182	Communication hardware abnormal	Hardware controlling communication between NC and drive is abnormal.
183	ASIC PWM compare match error	Error occurs within ASIC.
184	ASIC WDCI error	Error occurs within ASIC.
189	Converter system error	Hardware of the converter is abnormal.
193	Crash prevention detect	Servo motor is crashing.
197	Motor magnetic pole detection abnormal	Magnetic pole detection signal is abnormal.
198	FPG disconnection (PA,PB)	A,B phase signal line of the external encoder is disconnected.
199	FPG disconnection (PC)	C phase signal line of the external encoder is disconnected.
200	Encoder clear abnormal	Multi-revolution of the absolute encoder is not properly cleared.
201	Encoder communication abnormal	Communication between encoder and servo pack is not possible.
202	Encoder parameter abnormal	Parameter of the encoder is destroyed.
203	Encoder echo-back abnormal	Contents of communication with the encoder are wrong.
204	Multi-turn limit value disagree	The multi-return limit values of the encoder and servo pack do not agree.
208	Position deviation too large	Position deviation pulse exceeds the set value of user constant (Cn6965).
225	Time-out error	After power is on, communication between NC - drive is not possible.
226	Converter WDC abnormal	Synchronization between converter - drive is out of order.
227	Converter data abnormal	Data between converter - drive are abnormal.
229	Network communication abnormal	No acknowledgement comes from NC.
230	Link setting error	Settings of NC and drive are different.
234	Drive initial access error	When power is entered, communication between converter - drive is not possible.
236	Drive WDC abnormal	No acknowledgement comes from the drive.
241	Power line no phase	Phase of input power is missing.
242	Power source frequency deviation too large	Power source frequency is abnormal.

No.	Warning	Contents
148	Network data setting warning	
147	Network command setting warning	
150	Network communication warning	
151	Heat sink over-heat	If current operation is continued, there may be a heat sink over-heat alarm.
	Motor over-heat warning	If current operation is continued, there may be a motor over-heat alarm.

(Note) Monitor operation is continued under warning state.

4. PLC ALARMS

4.1 General Alarms

4.1.1 Errors and instructions when starting up

Alarm No.	Alarm message
401901	Parameter BAGNo in FC19 is invalid.
401902	Parameter chanNo in FC19 is invalid.
402501	Parameter BAGNo in FC25 is invalid.
402502	Parameter chanNo in FC25 is invalid.
400106	Re-start after deleting DB6 in PLC.
400102	Re-start after deleting DB2 in PLC.
400103	Re-start after deleting DB3 in PLC.
400109	Re-start after deleting DB9 in PLC.
400171	Re-start after deleting DB71 in PLC.
400172	Re-start after deleting DB72 in PLC.
400173	Re-start after deleting DB73 in PLC.
400174	Re-start after deleting DB74 in PLC.
401702	Parameter SpindleIFNo in FC17 is invalid.
410150	Volume of M group decoding list is too large.
400902	Parameter ChanNo in FC9 is invalid.
401502	Parameter AxisNo in FC15 is invalid.
401602	Parameter AxisNo in FC16 is invalid.
401805	Parameter AxisNo in FC18 is invalid.
400604	Change is set, M06 in machine data

4.1.2 Errors when running

Alarm No.	Alarm message
400262	Hasheld unit failure
400250	NCK sign-of life monitoring
400251	NCK power is not on
400260	Machine control panel 1 failure
400261	Machine control panel 2 failure
400252	Sign-of-life monitoring

4.2 PLC-CPU System Error

Alarm No.	Alarm message
810001	OB event error, error analysis is necessary from STEP7
810002	Synchronization error, error analysis is necessary from STEP7
810003	Asynchronous error, error analysis is necessary from STEP7
810004	Stop/abort event, error analysis is necessary from STEP7
810005	BZ sequence event, error analysis is necessary from STEP7
810006	Communication event error, error analysis is necessary from STEP7
810007	H/F system event error, error diagnosis is necessary from STEP7
810008	Diagnostic data from error module, error diagnosis is necessary from STEP7
810009	Error analysis, user diagnostic event required by STEP7

5. GLOSSARY/ABBREVIATIONS

5.1 Abbreviations

ASCII	American Standard Code for Information Interchange
BCD	Binary Coded Decimal
CNC	Computerized Numerical Control
CP	Communication Processor
CPU	Central Processing Unit
CR	Carriage Return
CRC	Cutter Radius Compensation
CSB	Central Service Board: PLC module
CTS	Clear T Send: Signal serial data: interface
DAC	Digital-to-Analog Converter
DB	Data Block
DIN	German Standard
DIO	Data Input/Output transfer display
DRF	Differential Resolver Function: Handwheel displacement
DRY	Dry Run
DSB	Decoding Single Block
DSR	Data Send Ready: Signal from serial data interfaces
DW	Data Word
EIA Code	Special punched tape code, number of holes per character always odd
EPROM	Erasable Programmable Read Only Memory
ETC	ETC key: Softkey bar extension in the same menu
FDB	Product DataBase
FDD	Feed Drive (spindle)
FIFO	First in First Out: Memory that works without addresses and whose data is read in the same sequence as stored.
FM	Function Module
FM-NC	Function Module Numerical Control
FRA	Frame
FRAME	Coordinate conversion with the components zero offset, rotation, scaling, mirroring
FST	Feed Stop
GUD	Global User Data
HD	Hard Disk
HHU	Handheld Unit
HMS	High-resolution Measuring System
HW	Hardware
I	Input
IM	Interface Module
IM S/R	Interface Module (Send/Receive)
INC	Incremental Mode
I/RF	Infeed/Regenerative Feedback Module

ISO Code	Special punched tape code, number of holes per character always even
K1...K4	Channel 1 to channel 4
Kue	Speed ratio
Kv	Servo gain factor
LAD	Ladder diagram
LCD	Liquid Crystal Display
LEC	Leadscrew Error Compensation
LED	Light Emitting Diode
LUD	Local User Data
MB	Megabyte
MCP	Machine Control Panel
MD	Machine Data
MDA	Manual Data Automatic
MK	Measuring circuit
MLFB	Order No. (machine readable)
MMC	Man-Machine Communication: Operator interface in numerical control for operation, programming and simulation
MPF	Main Program File (NC part program)
MPI	Multi-Point Interface
MSD	Main Spindle Drive
NC	Numerical Control
NCK	Numerical Control Kernel
NCU	Numerical Control Unit
NURBS	Non-Uniform Rational B-Spline
O	Output
OEM	Original Equipment Manufacturer
OI	Operator Interface
OP	Operator Panel
OPI	Operator Panel Interface
PC	Personal Computer
PCMCIA	Personal Computer Memory Card International Association (interface convention)
PG	Programming device
PLC	Programmable Logic Controller
PRT	Program Test
RAM	Random Access Memory (can be read and written)
RISC	Reduced Instruction Set Computer
ROV	Rapid Override
RPA	R Parameter Active: Memory area in the NCK for R parameter numbers
RTS	Request To Send: Control signal from serial data interfaces
SBL	Signal Block
SD	Setting Data
SEA	Setting Data Active: Memory area in the NCK for setting data
SKP	Skip Block
SM	Signal Module

SPF	Sub Program File
SSI	Serial Synchronous Interface
SW	Software
TEA	Testing Data Active: Refers to machine data
TO	Tool Offset
TOA	Tool Offset Active: Memory area for tool offsets
TRANSMIT	Transform Milling into Turning: Coordinate transformation on turning machines for milling
ZO	Zero Offset
ZOA	Zero Offset Active: Memory area for zero offsets

III. PARAMETERS

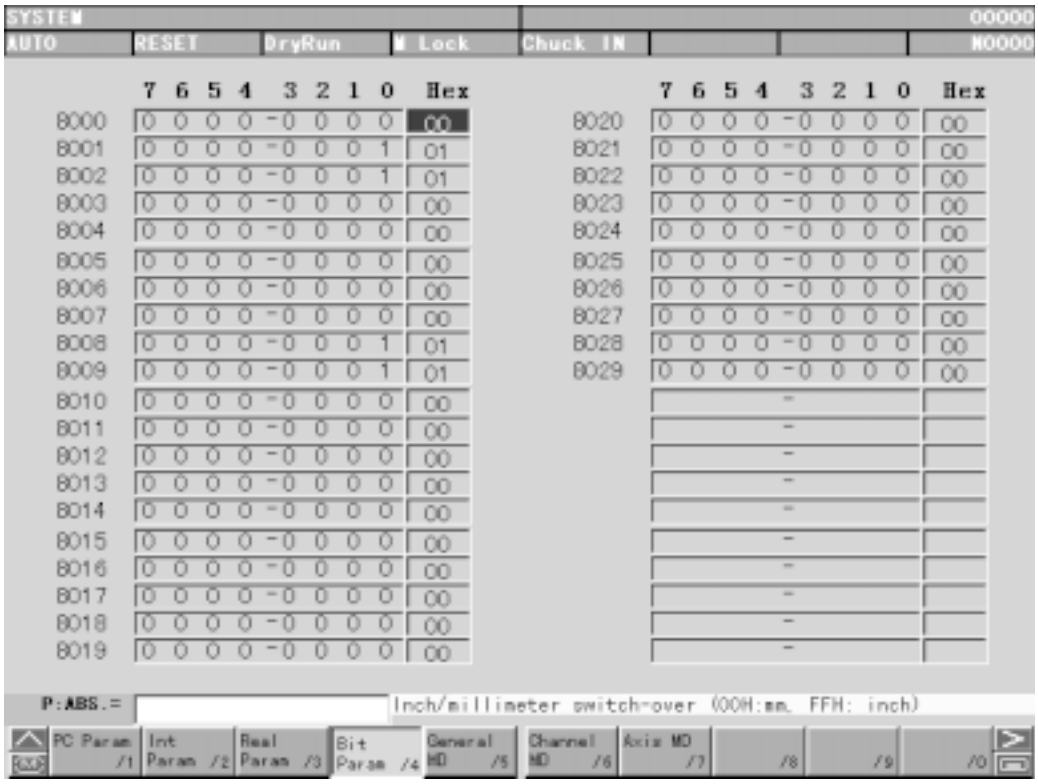
1. PARAMETERS, DISPLAY AND SETTING

1.1 Parameter Display

1.1.1 Display of parameters unique to Hitachi Seiki

① Press [∧] in the overall screen and press [F4/SYSTEM] in the maintenance menu.

② Enter menu No. [1] directly from the key or set the cursor to the [Parameter], using [↑] [↓] keys, and press [Input], then the parameter screen is displayed.



1.1.2 Display of machine data

① Press [∧], then [F4/SYSTEM] in the maintenance menu to display the system screen. Then, bring the cursor onto the "Y menu" and press [INPUT] to display the Y screen.
Press [MENU SELECT] .
Press [F6/START-UP] , then [F1/MACHINE DATA] to display the machine data screen.
Select from among [F1/GENERAL MD] , [F2/CHANNEL MD] , [F3/AXIS MD] etc for setting.
Press the function to display each screen.
These are to display the machine data screens. To display setting data screens, display the Y screen the same as ①, press [F2/PARAMETER] and press [F3/SETTING DATA] .

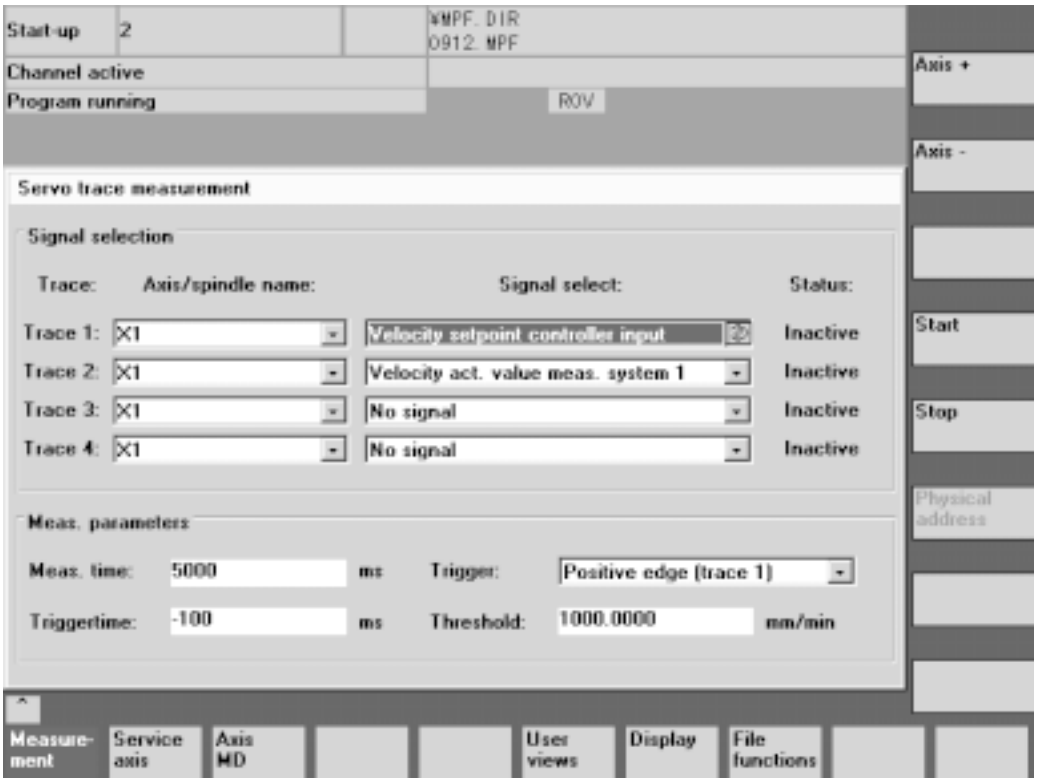


Fig. 1.1 Parameter screen

② Press the function search, enter the parameter number you want to display and press [INPUT] .
Instead of searching parameter numbers, you can change the screen with the page key.

1.2 Parameter Setting

1.2.1 Parameter Format

The parameters are classified as follows according to their data type.

Table 1.2.1

Data type	Data range
Boolean	0 or 1
Byte	-128 ~ 127
Double	4.19*10(-307) ~ 1.67*10(+308)
D word	-2.147*10(+9) ~ 2.147*10(+9)
String	Character string (up to 16 characters)
U word	0 ~ 65536
S word	-32768 ~ 32768
UD word	0 ~ 4294967300
SD word	-2147483650 ~ 2147483649
FD word	8.43*10(-37) ~ 3.37*10(+38)
Word	0000 ~ FFFF(H)

(Note 1) Data of each axis are in the axis MD.
Data of each channel are in the channel MD.

(Note 2) Above data ranges are general ranges. As the data range varies for each parameter number, see each parameter explanation for the details.

1.2.2 Entry from MDI Panel

① Enter the MDI mode.
② Activate the memory write switch.
③ Reset NC to have the reset state.
④ Press [∧] , then [F4/SYSTEM] in the maintenance menu to display the system screen. Then, bring the cursor onto the "Y menu" and press [INPUT] to display the Y screen.
Press [MENU SELECT] .
Press [F6/START-UP] , then [F1/MACHINE DATA] to display the machine data screen.
Select from among [F1/GENERAL MD] , [F2/CHANNEL MD] , [F3/AXIS MD] etc for setting.
Press the function to display each screen.
These are to display the machine data screens. To display setting data screens, display the Y screen the same as ④, press [F2/PARAMETER] and press [F3/SETTING DATA] .
⑤ Press the function search, enter the parameter number you want to display and press [INPUT].
Instead of searching parameter numbers, you can change the screen with the page key.
⑥ Key in the data you want to set and press [INPUT] .

2. PARAMETER EXPLANATION

Parameters are classified as follows according to their number.

2.1 Drive machine data (No.1000 ~)
2.2 Machine data for operator panel (No.9000 ~)
2.3 General machine data (No.10000 ~)
2.4 Channel-specific machine data (No.20000 ~)
2.5 Axis-specific machine data (No.30000 ~)
2.6 General setting data (No.41000 ~)
2.7 Channel-specific setting data (No.42000 ~)
2.8 Axis-specific setting data (No.43000 ~)
2.9 Compile cycle general machine data (No.61000 ~)
2.10 Compile cycle channel-specific machine data (No.62000 ~)
2.11 Compile cycle axis-specific machine data (No.63000 ~)

(Note 1) The "Active" in the parameter list indicates after which behavior the parameter change becomes active.

po (POWER ON)	Power on
cf (NEW_CONF)	"Activate MD" press the soft key. Press the RESET key. Change is possible at the block boundary of the program mode.
re (RESET)	When M2/M30 program ends. Press the RESET key.
im (IMMEDIATELY)	After entering values.

(Note 2) As for the parameters unique to Hitachi Seiki, see "2.9 GUD Parameters" and "2.10 Parameters defined by makers".

2.1 DRIVE MACHINE DATA

2.1.1 Axis Drive Machine Data

Number	Name	Data type	Contents	Setting range (Default)	Unit	Active
3000	FUNCTION_SWITCH_ BASIC	Word	Function select basic switch	0 ~ 0FA1 (10)	-	po
3001	FUNCTION_SWITCH_ APPLI1	Word	Function select application switch 1	0 ~ 0022 (0)	-	po
3002	FUNCTION_SWITCH_ APPLI2	Word	Function select application switch 2	0 ~ 8100 (0)	-	po
3003	FUNCTION_SWITCH_ APPLI3	Word	Function select application switch 3	0 ~ 4F4F (2)	-	po
3004	FUNCTION_SWITCH_ APPLI4	Word	Function select application switch 4	0 ~ 0312 (0)	-	po
3005	FUNCTION_SWITCH_ APPLI5	Word	Function select application switch 5	0 ~ FFFF (0)	-	po
3006	FUNCTION_SWITCH_ APPLI6	Word	Function select application switch 6	0 ~ 0172 (0)	-	po
3007	KV	US word	Velocity loop gain	10 ~ 20000 (400)	0.1Hz	im
3008	KVI	US word	Velocity loop integral constant	15 ~ 51200 (2000)	0.01ms	im
3009	KP	US word	Position loop gain	10 ~ 20000 (400)	0.1/s	im
3010	LOAD_LNERTIA_RATIO	US word	Load inertia	0 ~ 10000 (0)	%	im
3011	KV2	US word	2nd velocity loop gain	10 ~ 2000 (400)	0.1Hz	im
3012	KVI2	US word	2nd velocity loop integral constant	15 ~ 51200 (2000)	0.01ms	im
3013	KP2	US word	2nd position loop gain	10 ~ 20000 (400)	0.1/s	im
3014	BIAS	US word	Bias	0 ~ 450 (0)	r/min	im
3015	BIAS_ADDITION_WIDTH	US word	Bias addition width	0 ~ 250 (0)	-	im
3016	FEEDFORWARD	US word	Feed forward	0 ~ 100 (0)	%	im
3017	FF_FILTER_TIME_CONST	US word	Feed forward filtering constant	0 ~ 6400 (0)	0.01ms	im
3018	GAIN_SWITCH	Word	Gain related application switch	0 ~ 3014 (4)	-	im
3019	MODE_SWITCH_TORQUE	US word	Mode switch (torque specification)	0 ~ 800 (200)	%	im
3020	MODE_SWITCH_SPEED	US word	Mode switch (speed specification)	0 ~ 10000 (0)	r/min	im
3021	MODE_SWITCH_ACCEL	US word	Mode switch (acceleration)	0 ~ 3000 (0)	10r/min/s	im
3022	MODE_SWITCH_ ERROR_ PULSE	US word	Mode switch (error pulse)	0 ~ 10000 (0)	-	im
3023	SWITCH_ONLINE_ AUTO_TUNING	Word	On-line auto tuning related switch	0 ~ 2212 (12)	-	im
3024	SPEED_FEEDBACK_ COMP_GAIN	US word	Speed feedback compensation gain	1 ~ 100 (100)	%	im
3025	SPEED_FEEDBACK_ DELAY_COMP	US word	Speed feedback delay compensation (speed feedback compensation inertia gain)	1 ~ 1000 (100)	%	im
3026	TRQ_DUMP_GAIN_ ANTIVIBRATION	US word	Anti-vibration torque dumping gain	0 ~ 1000 (1000)	%	im

3027	APD_DUMP_GAIN_ ANTIVIBRATION	US word	Anti-vibration speed dumping gain	0 ~ 1000 (200)	%	im
3028	LPF_CONST_ ANTIVIBRATION	US word	Anti-vibration low-pass filtering constant	0 ~ 65535 (0)	0.01ms	im
3029	HPF_CONST_ ANTIVIBRATION	US word	Anti-vibration high-pass filtering constant	0 ~ 65535 (65535)	0.01ms	im
3030	CURR_GAIN_DELAYED	US word	Current loop gain delaying	20 ~ 100 (100)	%	im
3031	RESERVED	US word	Reserved constant	50 ~ - (100)	-	im
3032	LOOP_GAIN_MFC	US word	MFC gain	10 ~ 20000 (400)	0.1/s	im
3033	DUMP_FACTOR_MFC	US word	MFC dumping factor	500 ~ 2000 (1000)	-	im
3034	MECHA_RESONANCE_ FREQ_MFC	US word	MFC mechanic resonance frequency	10 ~ 1500 (500)	0.1Hz	im
3035	RESONANCE_FREQ_ MFC	US word	MFC resonance frequency	10 ~ 1500 (700)	0.1Hz	im
3036	SPD_FF_GAIN_MFC	US word	MFC speed FF gain	0 ~ 1500 (1000)	-	im
3037	TRQ_FF_GAIN_MFC	US word	MFC torque FF gain	0 ~ 1500 (1000)	-	im
3038	KI	US word	Position integral constant	0 ~ 2000 (0)	ms	im
3039	KD	US word	Position differential constant	0 ~ 51200 (0)	0.01ms	im
3040	GAIN_DISTURB_ OBSERVER	US word	Disturbance observer gain	1 ~ 1000 (50)	Hz	im
3041	HPF_CUT_FREQ_ DISTURB_OBSRVR	US word	Disturbance observer high-pass filter cut-off frequency	0 ~ 2000 (0)	Hz	im
3042	EST_DISTURB_TRQ_ FACTOR	US word	Estimated disturbance torque factor	0 ~ 100 (0)	%	im
3043	LPF_CUT_FREQ_ DISTURB_OBSRVR	US word	Disturbance observer low-pass filter cut-off frequency	0 ~ 2000 (0)	Hz	im
3044	INERTIA_ADJ_ DISTURB_OBSRVR	US word	Disturbance observer inertia adjustment	1 ~ 1000 (100)	%	im
3045	SWITCH_FUNCTION_1	Word	Function switch 1	0 ~ 0011 (0)	-	im
3046	SWITCH_FUNCTION_2	Word	Function switch 2	0 ~ 0110 (0)	-	im
3047	RESERVED	US word	Reservation constant	0 ~ 2000 (85)	-	im
3048	OBSERVER_GAIN_ ANTIVIBR	US word	Anti-vibration observer gain	1 ~ 1000 (100)	Hz	im
3049	LOAD_LNERTIA_ADJ_ ANTIVIBR	US word	Anti-vibration observer inertia adjustment	1 ~ 1000 (100)	%	im
3050	KV3	US word	3rd speed loop gain	10 ~ 20000 (400)	0.1Hz	im
3051	KVI3	US word	3rd speed loop integral constant	15 ~ 51200 (2000)	0.01ms	im
3052	KP3	US word	3rd position loop gain	10 ~ 20000 (400)	0.1/s	im
3053	KV4	US word	4th speed loop gain	10 ~ 20000 (400)	0.1Hz	im
3054	KVI4	US word	4th speed loop integral constant	15 ~ 51200 (2000)	0.01ms	im
3055	KP4	US word	4th position loop gain	10 ~ 20000 (400)	0.1/s	im
3056	SWITCH_PREDICTED_1	Word	1st prediction control switch	0 ~ 0222 (0)	-	im
3057	PARAM_C_PREDICTED_ 1	US word	1st prediction control parameter C	0 ~ 1000 (800)	0.01	im

3058	PARAM_CD_ PREDICTED_ 1	US word	1st prediction control parameter Cd	0 ~ 1000 (0)	0.01	im
3059	PARAM_ALPHA_ PREDICTED_1	S word	1st prediction control parameter α	-90 ~ 1000 (0)	0.01	im
3060	EQUIV_KP_ADJ_ PREDICTED_1	S word	1st prediction control equivalent Kp fine adjustment	-10000 ~ 10000 (0)	0.1/s	im
3061	SPD_FF_GAIN_ PREDICTED_1	US word	1st prediction control speed FF gain	0 ~ 100 (0)	%	im
3062	TRG_FF_GAIN_ PREDICTED_1	US word	1st prediction control torque FF gain	0 ~ 100 (0)	%	im
3063	TRG_FF_FIL_T_CONST_ PREDICTED_1	US word	1st prediction control torque FF filling constant	0 ~ 65535 (0)	0.01ms	im
3064	PARAM_C_PREDICTED_2	US word	2nd prediction parameter C	0 ~ 1000 (800)	0.01	im
3065	PARAM_CD_ PREDICTED_2	US word	2nd prediction control parameter Cd	0 ~ 1000 (0)	0.01	im
3066	PARAM_ALPHA_ PREDICTED_2	S word	2nd prediction control parameter α	-90 ~ 1000 (0)	0.01	im
3067	EQUIV_KP_ADJ_ PREDICTED_2	S word	2nd prediction control equivalent Kp fine adjustment	-10000 ~ 10000 (0)	0.1/s	im
3068	SPD_FF_GAIN_ PREDICTED_2	US word	2nd prediction control speed FF gain	0 ~ 100 (0)	%	im
3069	TRG_FF_GAIN_ PREDICTED_2	US word	2nd prediction control torque FF gain	0 ~ 100 (0)	%	im
3070	TRG_FF_FIL_T_CONST_ PREDICTED_2	US word	2nd prediction control torque FF filling constant	0 ~ 65535 (0)	0.01ms	im
3071	PARAM_C_PREDICTED_3	US word	3rd prediction parameter C	0 ~ 1000 (800)	0.01	im
3072	PARAM_CD_ PREDICTED_3	US word	3rd prediction control parameter Cd	0 ~ 1000 (0)	0.01	im
3073	PARAM_ALPHA_ PREDICTED_3	S word	3rd prediction control parameter α	-90 ~ 1000 (0)	0.01	im
3074	EQUIV_KP_ADJ_ PREDICTED_3	S word	3rd prediction control equivalent Kp fine adjustment	-10000 ~ 10000 (0)	0.1/s	im
3075	SPD_FF_GAIN_ PREDICTED_3	US word	3rd prediction control speed FF gain	0 ~ 100 (0)	%	im
3076	TRG_FF_GAIN_ PREDICTED_3	US word	3rd prediction control torque FF gain	0 ~ 100 (0)	%	im
3077	TRG_FF_FIL_T_CONST_ PREDICTED_3	US word	3rd prediction control torque FF filling constant	0 ~ 65535 (0)	0.01ms	im
3078	1ST_GAIN_QUAD_ERR_ COMP	US word	1st positive error compensation gain	0 ~ 65535 (10000)	-	im
3079	1ST_LMT_OFS_QUAD_ ERR_COMP	US word	1st positive error compensation limit	0 ~ 30000 (0)	0.01%	im
3080	2ND_GAIN_QUAD_ ERR_ COMP	US word	2nd positive error compensation gain	0 ~ 65535 (1000)	-	im

3081	2ND_LMT_OFS_QUAD_ ERR_COMP	US word	2nd positive error compensation limit	0 ~ 30000 (0)	0.01%	im
3082	P_LMT_ADJ_QUAD_ ERR_COMP	S word	Positive error compensation limit adjustment value	-30000 ~ 30000 (0)	.01%/ ms	im
3083	P_LMT_CLAMP_QUAD_ ERR_COMP	US word	Positive error compensation limit clamping value	0 ~ 30000 (0)	0.01%	im
3084	1ST_N_GAIN_QUAD_ ERR_COMP	US word	1st negative error compensation gain	0 ~ 65535 (10000)	-	im
3085	1ST_N_LMT_OFS_ QUAD_ ERR_COMP	US word	1st negative error compensation limit	0 ~ 30000 (0)	0.01%	im
3086	2ND_N_GAIN_QUAD_ ERR_COMP	US word	2nd negative error compensation gain	0 ~ 65535 (10000)	-	im
3087	2ND_N_LMT_OFS_ QUAD_ERR_COMP	US word	2nd negative error compensation limit	0 ~ 30000 (0)	0.01%	im
3088	N_LMT_ADJ_QUAD_ ERR_COMP	S word	Negative error compensation limit adjustment value	-30000 ~ 30000 (0)	.01%/ ms	im
3089	N_LMT_CLAMP_QUAD_ ERR_COMP	US word	Negative error compensation limit clamping value	0 ~ 30000 (0)	0.01%	im
3090	TIMING_CONST_QUAD_ ERR_COMP	S Word	Error compensation timing constant	-350 ~ 1600 (0)	-	im
3091	DAMP_RATIO_ANTIVIB_ ON_STP	US word	On stopping, anti-vibration damping ratio	0 ~ 30000 (0)	%	im
3092	START_TIME_ANTIVIB_ ON_STP	US word	On stopping, anti-vibration starting time	0 ~ 32767 (1024)	ms	im
3093	SCALE_OVRSHT_ CTRL_TIM_CONST	US word	Scale overshoot control time constant	0 ~ 65535 (0)	0.01ms	im
3094	SWITCH_POSITION_ CONTROL	Word	Position control instruction selection switch	0 ~ 300 (100)	-	im
3095	PG_DIVIDER	US word	PG division ratio	16 ~ 16384 (16384)	p/rev	im
3096	RESERVED	US word	Reserved constant	1 ~ 65535 (4)	-	im
3097	RESERVED	US word	Reserved constant	1 ~ 65535 (1)	-	im
3098	TIM_CONST_EXP_ ACCEL_DECEL1	US word	1st exponential acceleration deceleration constant	0 ~ 6400 (0)	0.01ms	im
3099	MULTITURN_LIMIT	US word	Multi-turn limit setting	0 ~ 65535 (65535)	rev	im
3100	RESERVED	US word	Reserved constant	513 ~ 16384 (16384)	-	im
3101	SWITCH_POSITION_REF	Word	Position instruction function switch	0 ~ 1111 (0)	-	im
3102	AVERAGING_TIME_ POS_REF_1	US word	1st position instruction travelling average time	0 ~ 6400 (0)	0.01ms	im
3103	AVERAGING_TIME_ POS_REF_2	US word	2nd position instruction travelling average time	0 ~ 6400 (0)	0.01ms	im
3104	PG_PLS_MTRRND_ LW_FULLCLOSED	US word	Full closed PG pulse/motor revolution (lower word)	0 ~ FFFF (8000)	-	im
3105	PG_PLS_MTRRND_ HW_FULLCLOSED	US word	Full closed PG pulse/motor revolution (higher word)	0 ~ FFFF (0)	-	im

3106	PG_PLS_ECDRND_ LW_FULLCLOSED	US word	Full closed PG pulse/encoder revolution (lower word)	0 ~ FFFF (4000)	-	im
3107	PG_PLS_ECDRND_ HW_FULLCLOSED	US word	Full closed PG pulse/encoder revolution (higher word)	0 ~ FFFF (0)	-	im
3108	ELECTRIC_GEAR_ NUMERATOR_LW	US word	Electric gear numerator (lower word)	0 ~ FFFF (1)	-	im
3109	ELECTRIC_GEAR_ NUMERATOR_HW	US word	Electric gear numerator (higher word)	0 ~ FFFF (0)	-	im
3110	ELECTRIC_GEAR_ DENOMIN_LW	US word	Electric gear denominator (lower word)	0 ~ FFFF (1)	-	im
3111	ELECTRIC_GEAR_ DENOMIN_HW	US word	Electric gear denominator (higher word)	0 ~ FFFF (0)	-	im
3112	BIAS_EXP_ACCEL_ DECEL_1	US word	1st exponential acceleration deceleration bias	0 ~ 65535 (0)	-	im
3113	TIM_CONST_EXP_ ACCEL_DECEL_2	US word	2nd exponential acceleration deceleration constant	0 ~ 6400 (0)	0.01ms	im
3114	BIAS_EXP_ACCEL_ DECEL_2	US word	2nd exponential acceleration deceleration bias	0 ~ 65535 (0)	-	im
3115	SHAPE_COMPENSATION	US word	Shape compensation constant	0 ~ 25000 (0)	0.01ms	im
3116	SHAPE_COMP_MFC	US word	MFC shape compensation constant	0 ~ 25000 (0)	0.01ms	im
3117	BACKLASH_COMP_1	US word	1st backlash compensation	0 ~ 65535 (0)	-	im
3118	TIME_CONST_ BACKLASH_COMP_1	US word	1st backlash compensation constant	0 ~ 65535 (0)	0.01ms	im
3119	BACKLASH_COMP_2	US word	2nd backlash compensation	0 ~ 65535 (0)	-	im
3120	TIME_CONST_ BACKLASH_COMP_2	US word	2nd backlash compensation constant	0 ~ 65535 (0)	0.01ms	im
3121	BACKLASH_COMP_3	US word	3rd backlash compensation	0 ~ 65535 (0)	-	im
3122	TIME_CONST_ BACKLASH_COMP_3	US word	3rd backlash compensation constant	0 ~ 65535 (0)	0.01ms	im
3123	BACKLASH_COMP_4	US word	4th backlash compensation	0 ~ 65535 (0)	-	im
3124	TIME_CONST_ BACKLASH_COMP_4	US word	4th backlash compensation constant	0 ~ 65535 (0)	0.01ms	im
3125	SPD_REF_GAIN	US word	Speed instruction input gain	150 ~ 3000 (600)	-	im
3126	INTERNAL_SET_ SPEED_1	US word	Internal setting speed 1	0 ~ 10000 (100)	r/min	im
3127	INTERNAL_SET_ SPEED_2	US word	Internal setting speed 2	0 ~ 10000 (200)	r/min	im
3128	INTERNAL_SET_ SPEED_3	US word	Internal setting speed 3	0 ~ 10000 (300)	r/min	im
3129	JOG_SPEED	US word	JOG speed	0 ~ 10000 (500)	r/min	im
3130	ACCEL_TIME_SOFT_ START	US word	Soft start acceleration time	0 ~ 10000 (0)	ms	im
3131	DECEL_TIME_SOFT_ START	US word	Soft start deceleration time	0 ~ 10000 (0)	ms	im

3132	RESERVED	US word	Reserved constant	0 ~ 65535 (40)	-	im
3133	TIME_CONST_SPD_F_B_FILTER	US word	Speed F/B filtering constant	0 ~ 65535 (0)	0.01ms	im
3134	TIME_CONST_SPD_REFNFF_FILTER	Word	(Speed instruction & speed FF) filtering constant	0 ~ 65535 (0)	0.01ms	im
3135	RESERVED	US word	Reserved constant	10 ~ 100 (30)	-	im
3136	TIME_CONST_TRQ_REF_FILTER	US word	1st stage low-pass filtering constant	0 ~ 65535 (100)	0.01ms	im
3137	FORWARD_TORQUE_LIMIT	US word	Forward torque limit	0 ~ 800 (800)	%	im
3138	REVERSE_TORQUE_LIMIT	US word	Reverse torque limit	0 ~ 800 (800)	%	im
3139	EXTERNAL_FWD_TORQUE_LIMIT_1	US word	1st forward external torque limit	0 ~ 800 (100)	%	im
3140	EXTERNAL_REV_TORQUE_LIMIT_1	US word	1st reverse external torque limit	0 ~ 800 (100)	%	im
3141	EMERGENCY_STOP_TORQUE	US word	Emergency stop torque	0 ~ 800 (800)	%	im
3142	RESERVED	US word	Reserved constant	0 ~ 10000 (10000)	-	im
3143	SWITCH_NOTCH_FILTERS	Word	Notch filter function switch	0 ~ 0111 (0)	-	im
3144	FREQUENCY_NOTCH_FILTER_1	US word	1st stage notch filter frequency	50 ~ 2000 (2000)	Hz	im
3145	Q_VALUE_NOTCH_FILTER_1	US word	1st stage notch filter Q value	70 ~ 100 (70)	0.01	im
3146	FREQUENCY_NOTCH_FILTER_2	US word	2nd stage notch filter frequency	50 ~ 2000 (2000)	Hz	im
3147	Q_VALUE_NOTCH_FILTER_2	US word	2nd stage notch filter Q value	70 ~ 100 (70)	0.01	im
3148	TORQUE_FILTER_CONSTANT_2	US word	2nd stage low-pass filtering constant	0 ~ 65535 (0)	0.01ms	im
3149	TORQUE_FILTER_CONSTANT_3	US word	3rd stage low-pass filtering constant	0 ~ 65535 (50)	us	im
3150	EXTERNAL_FWD_TORQUE_LIMIT_2	US word	2nd forward external torque limit	0 ~ 800 (100)	%	im
3151	EXTERNAL_REV_TORQUE_LIMIT_2	US word	2nd reverse external torque limit	0 ~ 800 (100)	%	im
3152	GRAVITY_COMP_TORQUE	S word	Gravity compensation torque	-20000 ~ 20000 (0)	0.01%	im
3153	POS_COMPLETION_RANGE	US word	Positioning completion width	0 ~ 250 (7)	-	im
3154	ZERO_CLAMP_LEVEL	US word	Zero clamp level	0 ~ 10000 (10)	r/min	im
3155	ZERO_SPEED_LEVEL	US word	Zero speed level	1 ~ 10000 (20)	r/min	im
3156	SPEED_WINDOW	US word	Speed matching signal output width	0 ~ 100 (10)	r/min	im

3157	NEAR_WINDOW	US word	NEAR signal width	1 ~ 250 (7)	-	im
3158	OVERFLOW_LEVEL	US word	Overflow level	1 ~ 372767 (1024)	-	im
3159	DELAY_FROM_BRKSIG_ TO_SVOFF	US word	Brake instruction, servo-off delay time	1 ~ 50 (0)	10ms	im
3160	SPD_ON_BRAKE_SIG_ OUT	US word	Brake instruction output speed level	0 ~ 10000 (100)	r/min	im
3161	SV_OFF_BRK_SIG_ WAIT_TIME	US word	Servo-off, brake instruction waiting time	10 ~ 100 (50)	10ms	im
3162	RESERVED	US word	Reserved constant	20 ~ 1000 (20)	-	im
3163	RESERVED	Word	Reserved constant	0 ~ FFFF (8880)	-	im
3164	RESERVED	Word	Reserved constant	0 ~ FFFF (8888)	-	im
3165	RESERVED	Word	Reserved constant	0 ~ FFFF (8888)	-	im
3166	RESERVED	Word	Reserved constant	0 ~ FFFF (8888)	-	im
3167	RESERVED	Word	Reserved constant	0 ~ FFFF (0)	-	im
3168	RESERVED	Word	Reserved constant	0 ~ FFFF (0)	-	im
3169	RESERVED	Word	Reserved constant	0 ~ FFFF (0)	-	im
3170	RESERVED	Word	Reserved constant	0 ~ FFFF (8888)	-	im
3171	RESERVED	Word	Reserved constant	0 ~ FFFF (0)	-	im
3172	POSITION_WINDOW_1	US word	1st positioning completion width	0 ~ 250 (7)	-	im
3173	POSITION_WINDOW_2	US word	2nd positioning completion width	0 ~ 250 (7)	-	im
3174	POSITION_WINDOW_3	US word	3rd positioning completion width	0 ~ 250 (7)	-	im
3175	DISTURB_TORQUE_ LEVEL_1	US word	1st torque disturbance level	0 ~ 800 (0)	%	im
3176	DISTURB_TORQUE_ LEVEL_2	US word	2nd torque disturbance level	0 ~ 800 (0)	%	im
3177	DISTURB_TORQUE_ LEVEL_3	US word	3rd torque disturbance level	0 ~ 800 (0)	%	im
3178	DISTURB_TORQUE_ LEVEL_4	US word	4th torque disturbance level	0 ~ 800 (0)	%	im
3179	COMPLIANCE_TORQUE	US word	Compliance torque	0 ~ 800 (0)	%	im
3180	EMERGENCY_STOP_ WAIT_TIME	US word	Emergency stop wait time	0 ~ 10000 (500)	ms	im
3181	RESERVED	US word	Reserved constant	0 ~ 65535 (0)	-	im
3182	RESERVED	US word	Reserved constant	0 ~ 65535 (0)	-	im
3183	COMMUNICATION_ CONTROL	US word	Communication control	0 ~ 0003 (0)	-	im
3184	FUNCTION_SWITCH_ APPLIC_7	Word	Function select application (soft LS)	0 ~ 0113 (0)	-	im
3185	COMMAND_MASK	Word	Command mask	0 ~ 0011 (0)	-	im
3186	ZERO_POINT_RANGE	Word	Original point range	0 ~ 250 (10)	-	im
3187	FORWARD_SOFTWARE_ LIMIT_LW	US word	Positive side software limit (lower word)	0 ~ FFFF (E000)	-	im
3188	FORWARD_SOFTWARE_ LIMIT_HW	US word	Positive side software limit (higher word)	0 ~ FFFF (04E1)	-	im

3189	REVERSE_SOFTWARE_LIMIT_LW	US word	Negative side software limit (lower word)	0 ~ FFFF (E000)	-	im
3190	REVERSE_SOFTWARE_LIMIT_HW	US word	Negative side software limit (higher word)	0 ~ FFFF (04E1)	-	im
3191	ABS_PG_ZERO_POINT_OFFS_LW	US word	Absolute PG zero point offset (lower word)	0 ~ FFFF (0)	-	im
3192	ABS_PG_ZERO_POINT_OFFS_HW	US word	Absolute PG zero point offset (higher word)	0 ~ FFFF (0)	-	im
3193	CONST_LINEAR_ACCEL_1	US word	1st stage linear acceleration constant	1 ~ 65535 (100)	-	im
3194	CONST_LINEAR_ACCEL_2	US word	2nd stage linear acceleration constant	0 ~ 65535 (100)	-	im
3195	SWITCH_SPEED_LINEAR_ACCEL	US word	Acceleration switching speed	0 ~ 65535 (0)	-	im
3196	CONST_LINEAR_DECEL_1	US word	1st stage linear deceleration constant	1 ~ 65535 (100)	-	im
3197	CONST_LINEAR_DECEL_2	US word	2nd stage linear deceleration constant	0 ~ 65535 (100)	-	im
3198	SWITCH_SPEED_LINEAR_DECEL	US word	Deceleration switching speed	0 ~ 65535 (0)	-	im
3199	BIAS_EXP_ACCEL_DECEL	US word	Exponential function acceleration deceleration bias	0 ~ 65535 (0)	-	im
3200	TIME_CONST_EXP_ACCEL_DECEL	US word	Exponential function acceleration deceleration constant	0 ~ 5100 (0)	-	im
3201	AVERAGING_TIME	US word	Travel average time	0 ~ 5100 (0)	-	im
3202	OPTION_MONITOR	Word	Option monitor	0 ~ 0033 (10)	-	im
3203	TOTAL_TRAVEL_LW_EXT_POS	US word	External positioning total travelling distance (lower word)	0 ~ FFFF (64)	-	im
3204	TOTAL_TRAVEL_HW_EXT_POS	US word	External positioning total travelling distance (higher word)	0 ~ FFFF (0)	-	im
3205	DIRECTION_ZERO_POINT_RET	Word	Zero point return direction	0 ~ 0001 (0)	-	im
3206	SPEED_1_ZERO_POINT_RET	US word	Zero point return approach speed 1	0 ~ 65535 (50)	-	im
3207	SPEED_2_ZERO_POINT_RET	US word	Zero point return approach speed 2	0 ~ 65535 (5)	-	im
3208	TOTAL_TRAVEL_LW_ZERO_RET	US word	Zero point return total travelling distance (lower word)	0 ~ FFFF (64)	-	im
3209	TOTAL_TRAVEL_HW_ZERO_RET	US word	Zero point return total travelling distance (higher word)	0 ~ FFFF (0)	-	im
3210	MASK_MFC_BANKSEL_0_3	Word	Model following control mask when selecting loop gain bank 0 ~ 3	0 ~ 1111 (0)	-	im
3211	ALARM_MASK	Word	Alarm mask	0 ~ 65535 (0)	-	im
3212	SYSTEM_SWITCH	Word	System switch	0 ~ 65535 (0)	-	im

3213	CONTROLLER_ SELECTION	Word	Controller selection	0 ~ 65535 (0)	-	im
3214	PARAMETER_ PASSWORD	Word	Parameter password	0 ~ 65535 (0)	-	im
3215	SVPACK_TYPE_N_ POWER_VOLTAGE	Word	Lower byte: Servo pack format code, Higher byte: Input voltage code	0 ~ FFFF (0)	-	im
3216	AMP_SIZE	Word	Servo pack capacity	0 ~ 65535 (0)	-	im
3217	Y_SPEC_NO	Word	Y specification number	0 ~ 65535 (0)	-	im
3218	TYPICAL_CURRENT	Word	Servo pack rated current	0 ~ 65535 (0)	0.1A	im
3219	MAX_CURRENT	Word	Servo pack maximum current	0 ~ 65535 (0)	0.1A	im
3220	MAIN_CIRCUIT_ CAPACITOR_SIZE	Word	Main circuit condenser capacity	0 ~ 65535 (0)	uF	im
3221	OL_DETECT_BASE_ ON_MID_CUR	Word	Lower byte: Over load detection base current (50 ~ 150) Higher byte: Over load detection intermediate current (10 ~ 80)	0 ~ FFFF ((20<<8)+115)	-	im
3222	OL_DETECT_BASE_ ON_MIDMAX_CUR	Word	Lower byte: With intermediate current, over load detection time (1 ~ 20) Higher byte: With maximum current, over load detection time (1 ~ 80)	0 ~ FFFF ((1<<8)+1)	-	im
3223	OL_WANING_RATIO	US word	OL warning ratio	0 ~ 100 (20)	%	im
3224	REGENERATIVE_ REGISTER	Word	Regenerative register value	0 ~ 65535 (0)	mohm	im
3225	DB_REGISTER	Word	DB register value	0 ~ 65535 (0)	mohm	im
3226	REGENERATIVENDB_ WATTAGE	Word	Lower byte: Regenerative register capacity (default) Higher byte: DB register capacity (default)	0 ~ FFFF (0)	-	im
3227	CURRENT_LOOP_ GAIN_D	US word	Current loop gain (D)		Hz	im
3228	CURRENT_LOOP_ GAIN_Q	US word	Current loop gain (Q)	400 ~ 3000 (400)	Hz	im
3229	CURRENT_LOOP_INT_ TIME_CONST_D	Word	Current loop integral constant (D)	0 ~ 65535 (0)	us	im
3230	CURRENT_LOOP_INT_ TIME_CONST_Q	Word	Current loop integral constant (Q)	0 ~ 65535 (0)	us	im
3231	CUR_LOOP_INT_ LIMIT_D	Word	Current loop integration limit (D)	0 ~ 65535 (1FFF)	-	im
3232	CUR_LOOP_INT_ LIMIT_Q	Word	Current loop integration limit (Q)	0 ~ 65535 (1FFF)	-	im
3233	CUR_LOOP_FIL_TIME_ CONST_Q	Word	Current loop filtering constant	0 ~ 65535 (0)	us	im
3234	CURRENT_EQUIVALENT_ GAIN	Word	Current conversion gain	0 ~ 65535 (0)	-	im

3235	CURRENT_DETECT_ GAIN	Word	Current detection gain	0 ~ 65535 (0)	-	im
3236	VOLTAGE_EQUIVALENT_ GAIN	Word	Voltage conversion gain	0 ~ 65535 (0)	-	im
3237	VOLTAGE_CORRECTION_ GAIN	Word	Voltage correction gain	0 ~ 65535 (2000)	-	im
3238	VOLTAGE_LIMIT	Word	Voltage limit value	0 ~ 65535 (7FFF)	-	im
3239	PWM_FREQUENCY	US word	PWM frequency	3000 ~ 15000 (3000)	Hz	im
3240	ON_DELAY_ TIMECOMPCONST	Word	Lower byte: On-delay time (0 ~ 30) Higher byte: On-delay compensation constant (0 ~ 255)	0 ~ FFFF (001E)	-	im
3241	ONDELAY_COMPSWLV LLNPHASCOMP	Word	Lower byte: On-delay compensation change level (0 ~ 255) Higher byte: Phase compensation (0 ~ 255)	0 ~ FFFF ((1<<8)+0)	-	im
3242	SWITCH_DQ	Word	DQ switch	0 ~ 65535 (0)	-	im
3243	SET_PARAMETER_1_ AD_DETECT	Word	A/D detection setting parameter 1	0 ~ 65535 (ACA3)	-	im
3244	SET_PARAMETER_2_ AD_DETECT	Word	A/D detection setting parameter 2	0 ~ 65535 (E0FE)	-	im
3245	SET_PARAMETER_3_ AD_DETECT	Word	A/D detection setting parameter 3	0 ~ 65535 (9340)	-	im
3246	SET_PARAMETER_4_ AD_DETECT	Word	A/D detection setting parameter 4	0 ~ 65535 (40AA)	-	im
3247	ADDRESS_MONITOR_1	Word	Monitor 1 address	0 ~ 65535 (8482)	-	im
3249	GAIN_MONITOR_1	Word	Monitor 1 gain	0 ~ 65535 (100)	-	im
3250	GAIN_MONITOR_2	Word	Monitor 2 gain	0 ~ 65535 (100)	-	im
3251	I_P_PERCENTNRA CINGDETECTTRQ	Word	Lower byte: i-p control ratio (0 ~ 100) Higher byte: Crash detection torque (0 ~ 255)	0 ~ FFFF ((120<<8)+10))	-	im
3252	CUR_DETECT_ZERO_ ADJ_U	Word	Current detection zero adjustment (U phase)	0 ~ 65535 (0)	-	im
3253	CUR_DETECT_ZERO_ ADJ_V	Word	Current detection zero adjustment (V phase)	0 ~ 65535 (0)	-	im
3254	CUR_DETECT_GAIN_ ADJ_U_V	Word	Current detection gain adjustment (U, V phase)	0 ~ 65535 (0)	-	im
3255	SPEED_REF_ZERO_ ADJ_U	Word	Speed instruction zero adjustment	0 ~ 65535 (0)	-	im
3256	SPEED_REF_GAIN_ ADJ_U	Word	Speed instruction gain adjustment	0 ~ 65535 (0)	-	im
3257	TORQUE_REF_ZERO_ ADJ_P_N	Word	Torque instruction zero adjustment (positive/negative input)	0 ~ 65535 (0)	-	im
3258	TORQUE_REF_GAIN_ ADJ_P_N	Word	Torque instruction gain adjustment (positive/negative input)	0 ~ 65535 (0)	-	im

3259	MONITOR_1_2_ZERO_ADJ	Word	Monitor 1, 2 zero adjustment	0 ~ 65535 (0)	-	im
3260	MONITOR_1_2_GAIN_ADJ	Word	Monitor 1, 2 gain adjustment	0 ~ 65535 (0)	%	im
3261	PG_POWER_VOLTAGE_ZERO_ADJ	Word	Lower byte: PG source voltage adjustment Higher byte: Empty	0 ~ 00FF (0)	-	im
3262	U_CURRENT_REF_OFFSET	Word	U phase current instruction offset	0 ~ 00FF (0)	-	im
3263	OL_DETECT_BASE_N_MID_TORQUE	Word	Lower byte: Over load detection base torque (0 ~ 255) Higher byte: Over load detection intermediate torque (0 ~ 255)	0 ~ FFFF ((100<<8)+10)	-	im
3264	OL_DETECT_MIDTIME_N_MIDTRQ2	Word	Lower byte: Over load detection intermediate time (0 ~ 255) Higher byte: Over load detection intermediate torque 2 (0 ~ 255)	0 ~ FFFF ((100<<8)+10)	-	im
3265	OL_DET_MIDTIME2_N_OS_DETLVL	Word	Lower byte: Over load detection intermediate time 2 (0 ~ 255) Higher byte: OS detection level (0 ~ 255)	0 ~ FFFF ((100<<8)+10)	-	im
3266	STANDALONE_FLAG	Word	Stand-alone switch	0 ~ 65535 (0)	-	po
3267	USER_PRM_CHECKSUM	Word	User constant checksum	0 ~ FFFF (0)	-	im
3268	SYSTEM_CHECKSUM	Word	System checksum	0 ~ FFFF (0)	-	im
3269	MOTORTYPE_PWRVOLT_ENCTYPE	Word	Motor type (8 bits), input voltage (4 bits), encoder type (4 bits)	0 ~ FFFF (0)	-	im
3270	ENCORDER_SOFT_VERSION	Word	Encoder software version	0 ~ FFFF (0)	-	im
3271	MOTOR_SIZE	US word	Motor capacity	1 ~ 65535 (1)	V	im
3272	ENC_BITS_N_DECIMAL_POSITION	Word	Encoder bit number, position data decimal position	C ~ 0014 (C)	-	im
3273	MULTITURN_LIMIT	Word	Multi-turn limit	0 ~ 65535 (0)	-	im
3274	RATED_N_MAX_SPEED	Word	Rated speed, maximum speed	0A0A ~ 6464 (0A0A)	-	im
3275	OS_DETECT_LEVEL_N_POLE_NUM	Word	OS detection level, pole number	200 ~ FF32 (200)	-	im
3276	RATED_TORAQUE	US word	Rated torque	0 ~ 65535 (0)	0.01Nm	im
3277	MAXIMUM_TORAQUE	US word	Maximum torque	100 ~ 800 (100)	%	im
3278	RATED_CURRENT	US word	Rated current	0 ~ 65535 (0)	0.1A	im
3279	MOMENTARY_MAXIMUM_CURRENT	US word	Momentary maximum current	0 ~ 65535 (0)	0.1A	im
3280	EMF_CONSTANT	US word	EMF constant	0 ~ 65535 (0)	-	im
3281	ROTOR_INERTIA	US word	Rotor inertia	0 ~ 65535 (0)	-	im
3282	ARMATURE_REGISTANCE	US word	Armature resistance	0 ~ 65535 (0)	mohm	im
3283	ARMATURE_INDUCTANCE	US word	Armature inductance	0 ~ 65535 (0)	-	im

3284	OL_DETECT_BASE_ TORQUE	US word	Over load detection base torque	100 ~ 150 (150)	%	im
3285	OL_DETECT_MID_ TORQUE	US word	Over load detection intermediate torque	10 ~ 80 (80)	%	im
3286	OL_DETECT_MID_TIME	US word	Over load detection intermediate time	1 ~ 20 (20)	-	im
3287	OL_DETECT_MID_ TORQUE_2	US word	Over load detection intermediate torque 2	10 ~ 80 (80)	%	im
3288	OL_DETECT_MID_ TIME_2	US word	Over load detection intermediate time 2	1 ~ 100 (100)	sec	im
3289	PHASE_COMANSATION	US word	Phase comp ensation	0 ~ 65535 (0)	deg	im

2.1.2 Spindle Drive Machine Data

Number	Name	Data type	Contents	Setting range (Default)	Unit	Active
6000	LANGUAGE_SELECTION	US word	Language selection for operator display	0 ~ 6 (1)	-	im
6001	CONSTANT_ACCESS_ LEVEL	US word	Constant access level	0 ~ 4 (2)	-	im
6002	USER_SETTING_ CONSTANT	US word	Selection of control mode	1 ~ 3 (3)	-	im
6003	INNITIALIZE	US word	Initialize	0 ~ 3330 (0)	-	im
6020	REFERENCE_SELECTION	US word	Selection of driving instruction	0 ~ 2 (0)	-	im
6030	ZERO_SPEED_DET_ LEVEL	US word	Zero speed detection level	3 ~ 600 (300)	-	im
6031	ZERO_SPEED_DET_ WIDTH	US word	Zero speed detection width	0 ~ 300 (20)	-	im
6032	ZERO_SPEED_BRAKING_ TIME	US word	Zero speed braking time	0 ~ 100 (0)	0.1s	im
6050	SOFT_START_TIME	US word	Soft start time	1 ~ 60000 (1)	0.1s	im
6051	ACCEL_TIME	US word	Acceleration time	1 ~ 60000 (100)	0.1s	po
6052	DECEL_TIME	US word	Deceleration time	1 ~ 60000 (100)	0.1s	po
6060	ASR_P_GAIN_H_1	US word	Speed control proportional gain (H)	10 ~ 20000 (300)	0.1Hz	im
6061	ASR_I_TIME_H_1	US word	Speed control integration time (H)	1 ~ 10000 (6000)	-	im
6062	ASR_P_GAIN_ML_1	US word	Speed control proportional gain (ML)	10 ~ 20000 (300)	0.1Hz	im
6063	ASR_I_TIME_ML_1	US word	Speed control integration time (ML)	1 ~ 10000 (6000)	-	im
6064	ASR_P_GAIN_H_2	US word	Speed control proportional gain (H servo)	10 ~ 20000 (400)	0.1Hz	im
6065	ASR_I_TIME_H_2	US word	Speed control integration time (H servo)	1 ~ 10000 (1000)	-	im
6066	ASR_P_GAIN_ML_2	US word	Speed control proportional gain (ML servo)	10 ~ 20000 (400)	0.1Hz	im
6067	ASR_I_TIME_ML_2	US word	Speed control integration time (ML servo)	1 ~ 10000 (1000)	-	im
6068	INERTIA_RATIO_H	US word	Inertia ratio (H)	0 ~ 10000 (0)	%	im

6069	INERTIA_RATIO_M	US word	Inertia ratio (M)	1 ~ 10000 (1000)	%	im
6070	INERTIA_RATIO_L	US word	Inertia ratio (L)	1 ~ 10000 (1000)	%	im
6071	ASR_PRIMARY_DELAY_TIME	US word	Torque instruction filtering constant	1 ~ 10000 (1000)	-	im
6072	ASR_T_TIME	US word	Torque instruction advancing time	1 ~ 10000 (1000)	ms	im
6073	ASR_P_GAIN_SELECT	US word	Speed proportional gain selection	1 ~ 10000 (1000)	-	im
6080	POSITION_CONTROL_P_GAIN_H	US word	Position control proportional gain (H)	1 ~ 10000 (1000)	-	im
6081	POSITION_CONTROL_P_GAIN_M	US word	Position control proportional gain (M)	1 ~ 10000 (1000)	-	im
6082	POSITION_CONTROL_P_GAIN_L	US word	Position control proportional gain (L)	1 ~ 10000 (1000)	-	im
6083	TRANSMITION_RATIO_1_H	US word	Spindle gear (H)	1 ~ 10000 (1000)	-	im
6084	TRANSMITION_RATIO_2_H	US word	Motor gear (H)	1 ~ 10000 (1000)	-	im
6085	TRANSMITION_RATIO_1_M	US word	Spindle gear (M)	1 ~ 65535 (1)	-	im
6086	TRANSMITION_RATIO_2_M	US word	Motor gear (M)	1 ~ 65535 (1)	-	im
6087	TRANSMITION_RATIO_1_L	US word	Spindle gear (L)	1 ~ 65535 (1)	-	im
6088	TRANSMITION_RATIO_2_L	US word	Motor gear (L)	1 ~ 65535 (1)	-	im
6089	POSTION_ROOP_ENC_SEL	US word	Position loop encoder selection	0 ~ 1 (0)	-	im
6100	TORQUE_COMP_GAIN	US word	Torque compensation gain	0 ~ 250 (100)	0.01	im
6101	TORQUE_COMP_TIME_CONSTANT	US word	Torque compensation delay constant	0 ~ 10000 (20)	ms	im
6110	SLIP_COMP_GAIN	US word	Slip compensation gain	0 ~ 25 (10)	0.1	im
6111	SLIP_COMP_DELAY_TIME	US word	Slip compensation delay constant	0 ~ 10000 (200)	ms	im
6112	SLIP_COMP_LIMIT	US word	Slip compensation limit	0 ~ 250 (200)	%	im
6113	SLIP_COMP_IN_REGENERATION	US word	Slip compensation during regenerative operation	0 ~ 1 (0)	-	im
6120	CARRIER_FREQUENCY_1	US word	Fast winding carrier frequency	0 ~ 2 (0)	-	im
6121	CARRIER_FREQUENCY_2	US word	Slow winding carrier frequency	0 ~ 2 (0)	-	im
6130	HUNTING_PREVENTION_SEL	US word	Hunting prevention function selection	0 ~ 1 (1)	-	im
6131	HUNTING_PREVENTION_GAIN	US word	Hunting prevention gain	0 ~ 250 (100)	0.01	im
6132	HUNTING_TIME	US word	Hunting prevention time constant	0 ~ 500 (25)	ms	im
6133	HUNTING_LIMIT	US word	Hunting prevention limit	0 ~ 100 (10)	%	im
6140	CARRIER_IN_TUNE	US word	Carrier frequency during auto tuning	0 ~ 2 (2)	-	im

6180	TORQUE_CONTROL_ SELECTION	US word	Torque control selection	0 ~ 1 (0)	-	im
6181	TORQUE_REF_DELAY_ TIME	US word	Torque instruction filter delay time constant	0 ~ 1000 (0)	ms	im
6182	SPEED_LIMIT_ SELECTION_1	US word	Speed limit selection	1 ~ 2 (1)	-	im
6183	SPEED_LIMIT_ SELECTION_2	US word	Speed limit	-120 ~ 120 (0)	-	im
6184	SPEED_LIMIT_BIAS	US word	Speed limit bias	0 ~ 120 (10)	%	im
6185	REF_HOLD_TIME	US word	Speed/torque control change timer	0 ~ 1000 (0)	ms	im
6200	MOTOR_FLUX_LOWER_ LIMIT	US word	Motor flux adjustment level	15 ~ 100 (15)	%	im
6201	SV_MODE_FLUX_ LEVEL_H	US word	Servo mode flux level (H)	30 ~ 100 (100)	%	im
6202	SV_BASE_SPEED_ RATIO_H	US word	Servo mode base speed ratio (H)	100 ~ 500 (100)	0.01	im
6203	SV_MODE_FLUX_ LEVEL_M_L	US word	Servo mode flux level (ML)	30 ~ 100 (100)	%	im
6204	SV_BASE_SPEED_ RATIO_M_L	US word	Servo mode base speed ratio (ML)	100 ~ 500 (100)	0.01	im
6220	MULTI_FUNCTION_ SELECTION_1	Word	Multi-function selection contact point	0000 ~ 0012 (0000)	-	im
6221	MULTI_FUNCTION_ SELECTION_2	Word	Multi-function selection contact point	0000 ~ 0012 (0001)	-	im
6222	MULTI_FUNCTION_ SELECTION_3	Word	Multi-function selection contact point	0000 ~ 0012 (0002)	-	im
6223	MULTI_FUNCTION_ SELECTION_4	Word	Multi-function selection contact point	0000 ~ 0012 (0003)	-	im
6224	MULTI_FUNCTION_ SELECTION_5	Word	Multi-function selection contact point	0000 ~ 0012 (0004)	-	im
6225	MULTI_FUNCTION_ SELECTION_6	Word	Multi-function selection contact point	0000 ~ 0012 (0005)	-	im
6226	MULTI_FUNCTION_ SELECTION_7	Word	Multi-function selection contact point	0000 ~ 0012 (0006)	-	im
6227	MULTI_FUNCTION_ SELECTION_8	Word	Multi-function selection contact point	0000 ~ 0012 (0007)	-	im
6228	MULTI_FUNCTION_ SELECTION_9	Word	Multi-function selection contact point	0000 ~ 0012 (0008)	-	im
6229	MULTI_FUNCTION_ SELECTION_10	Word	Multi-function selection contact point	0000 ~ 0012 (0009)	-	im
6230	MULTI_FUNCTION_ SELECTION_11	Word	Multi-function selection contact point	0000 ~ 0012 (000A)	-	im
6231	MULTI_FUNCTION_ SELECTION_12	Word	Multi-function selection contact point	0000 ~ 0012 (000B)	-	im

6232	MULTI_FUNCTION_ SELECTION_13	Word	Multi-function selection contact point	0 ~ 1 (0)	-	im
6240	MULTI_FUNCTION_ SELECTION_14	Word	Multi-function selection contact point	0000 ~ 000A (0000)	-	im
6241	MULTI_FUNCTION_ SELECTION_15	Word	Multi-function selection contact point	0000 ~ 000A (0001)	-	im
6242	MULTI_FUNCTION_ SELECTION_16	Word	Multi-function selection contact point	0000 ~ 000A (0002)	-	im
6243	MULTI_FUNCTION_ SELECTION_17	Word	Multi-function selection contact point	0000 ~ 000A (0003)	-	im
6244	MULTI_FUNCTION_ SELECTION_18	Word	Multi-function selection contact point	0000 ~ 000A (0005)	-	im
6245	MULTI_FUNCTION_ SELECTION_19	Word	Multi-function selection contact point	0000 ~ 000A (0006)	-	im
6246	MULTI_FUNCTION_ SELECTION_119	Word	Multi-function selection contact point	0000 ~ 000A (0007)	-	im
6247	MULTI_FUNCTION_ SELECTION_20	Word	Multi-function selection contact point	0000 ~ 000A (000A)	-	im
6250	MOTOR_SPEED_ ADJUSTMENT	US word	Motor speed adjustment value	9000 ~ 11000 (10000)	0.0001	im
6251	SPEED_REF_OFFSET_ ADJUST	S word	Speed instruction offset adjustment value	-80 ~ 80 (0)	-	im
6252	TORQUE_REF_ADJUST	US word	Torque instruction adjustment value	900 ~ 1000 (1000)	0.001	im
6253	TORQUE_REF_OFFSET_ ADJUST	S word	Torque instruction offset adjustment value	-80 ~ 80 (0)	-	po
6254	SPEEDOMETER_ ADJUST	US word	Speed meter signal adjustment value	90 ~ 150 (100)	0.01	im
6255	SPEEDOMETER_ OFFSET_ADJUST	S word	Speed meter signal offset adjustment value	-200 ~ 200 (0)	-	im
6256	LOAD_RATIO_ADJUST_1	US word	Load ratio signal adjustment value	90 ~ 150 (100)	0.01	im
6257	LOAD_RATIO_OFFSET_ ADJUST	S word	Load ratio signal offset adjustment value	-200 ~ 200 (0)	-	im
6258	LOAD_RATIO_ADJUST_2	US word	Load ratio signal full scale	120 ~ 500 (200)	%	im
6259	LOAD_RATIO_OUTPUT_ REF	US word	Load ratio output reference selection	0 ~ 1 (0)	-	im
6260	SERVO_SPEED_REF_ GAIN_1	US word	Servo mode speed instruction gain 1	0 ~ 10000 (10000)	0.01%	im
6261	SERVO_SPEED_REF_ GAIN_2	US word	Servo mode speed instruction gain 2	0 ~ 10000 (10000)	0.01%	im
6262	SERVO_MODE_ SENSITIVITY	US word	Servo mode sensitivity change selection	0 ~ 1 (0)	-	im
6263	LOAD_RATIO_METER_ FILTER	US word	Load ratio meter filtering constant	0 ~ 3 (0)	-	im
6264	SPPED_LIMIT_LEVEL	US word	Speed limit level selection	0 ~ 1 (0)	-	im

6265	LOAD_RATIO_ADJUST_3	US word	Load ratio meter adjustment method selection	0 ~ 1 (0)	-	im
6266	SERVO_SPEED_REF_GAIN	US word	Servo mode speed instruction gain selection	0 ~ 1 (0)	-	im
6280	MULTI_FUNCTION_SELECTION_21	Word	Multi-function selection contact point	0000 ~ 0012 (0000)	-	im
6330	MULTI_FUNCTION_SELECTION_22	Word	Multi-function selection contact point	0000 ~ 0012 (0000)	-	im
6400	SPEED_AGREE_WITH	US word	Speed agreement signal	10 ~ 50 (15)	%	im
6401	SPEED_DETECTION_LEVEL	US word	Speed detection signal level	0 ~ 10000 (1000)	0.01%	im
6402	SPEED_DETECTION_WIDTH	US word	Speed detection signal hysteresis	0 ~ 10000 (100)	0.01%	im
6403	EXCESSIVE_SPEED_DEV_SENS	US word	Sensitivity selection for excessive speed deviation	0 ~ 1 (0)	-	im
6404	EXCESSIVE_SPEED_DEV_TIME	US word	Behavior delay time selection for excessive speed deviation protection	0 ~ 3 (0)	-	im
6405	SPEED_AGREE_SIGNAL_SEL	US word	AGR output condition selection	0 ~ 1 (0)	-	im
6410	TORQUE_DETECTION_LEVEL	US word	Torque detection signal level	50 ~ 2000 (100)	-	im
6411	TORQUE_DETECTION_WIDTH	US word	Torque detection signal hysteresis	0 ~ 100 (10)	-	im
6412	TORQUE_DETECTION_OUTPUT	US word	TDET output method when accelerating	0 ~ 1 (0)	-	im
6413	LOAD_FAULT_DETECTION	US word	Load fault detection selection	0 ~ 1 (0)	-	im
6420	EXT_TORQUE_LIMIT	US word	External steering torque limit level	0 ~ 210 (10)	%	im
6421	TORQUE_LIMIT	US word	Motor torque limit level	0 ~ 210 (150)	%	im
6422	REGENERATION_TORQUE_LIMIT	US word	Regeneration side torque limit level	0 ~ 210 (150)	%	im
6423	TORQUE_LIMIT_SELECT	US word	Torque limit selection	0 ~ 1 (0)	-	im
6430	MOTOR_PROTECTION_SEL	US word	Motor protection function selection	0 ~ 0 (0)	-	im
6431	MOTOR_PROTECTION_TIME	US word	Motor protection time	0 ~ 0 (0)	-	im
6440	RESERVED_1	US word	Spare	0 ~ 0 (0)	-	im
6450	UNDERVOLTAGE_DETECT_LEVEL	US word	Low voltage detection level	150 ~ 210 (190)	V	im
6470	GATE_SIGNAL_TEST_MODE	US word	Gate signal test mode	0 ~ 1 (0)	-	po
6471	MEMORY_ACCESS_SELECTION	US word	Memory access selection	0 ~ 1 (0)	%	im
6472	MOTOR_1_OUTPUT	US word	Motor 1 output contents	0 ~ 799 (0)	-	im

6473	MOTOR_1_OUTPUT_ GAIN	US word	Motor 1 output gain	90 ~ 150 (100)	0.01	im
6474	MOTOR_1_OFFSET	S word	Motor 1 offset	-200 ~ 200 (0)	-	im
6475	MOTOR_2_OUTPUT	US word	Motor 2 output contents	0 ~ 799 (1)	-	im
6476	MOTOR_2_OUTPUT_ GAIN	US word	Motor 2 output gain	90 ~ 150 (100)	0.01	im
6477	MOTOR_1_OFFSET	US word	Motor 2 offset	-200 ~ 200 (0)	-	im
6478	AVR_TIME_CONSTANT	US word	AVR time constant	0 ~ 1000 (10)	-	im
6479	CURRENT_LIMITING_ GAIN	US word	Current limit gain	100 ~ 2000 (100)	0.01	im
6480	CURRENT_LIMITING_ FILTER	US word	Current limit filtering constant	0 ~ 1000 (100)	-	im
6481	CURRENT_LIMITING_ VALUE_1	US word	Current limit value 1	0 ~ 3000 (2500)	-	im
6482	CURRENT_LIMITING_ VALUE_2	US word	Current limit value 2	0 ~ 3000 (2500)	-	im
6483	CURRENT_LIMITING_ VALUE_3	US word	Current limit value 3	0 ~ 3000 (2500)	-	im
6490	DRIVE_MODE_DISPLAY	US mode	Drive mode display item	0 ~ 0 (0)	-	im
6491	MONITORING_AT_ STARTUP	US mode	Monitor display when power in ON	0 ~ 0 (0)	-	im
6495	INVERTER_CAPACITY_ SEL	Word	Inverter capacity selection	0000 ~ 002F (B)	-	im
6500	RATED_SPEED_SETTING	US Word	Rated speed setting	100 ~ 60000 (7000)	r/min	im
6501	MOTOR_CODE_ SELECTION	Word	Motor code selection	0001 ~ 01FF (FF)	-	po
6502	TRACEBACK_DATA_ SEL_1	US word	Trace back data selection 1	101 ~ 799 (108)	-	im
6503	TRACEBACK_DATA_ SEL_2	US word	Trace back data selection 2	101 ~ 799 (108)	-	im
6504	TORQUE_LIMIT_AUTO_ JUDGE	US word	Torque limit auto judgement selection	0 ~ 1 (0)	-	im
6505	LOW_SPEED_WINDING	US word	Low speed winding selection	0 ~ 1 (0)	-	im
6506	TRACEBACK_DATA_ DISPLAY	US word	Trace-back data display selection	0 ~ 1 (0)	-	im
6507	TRACEBACK_DATA_ SAVE	US word	Trace-back data save selection	0 ~ 1 (0)	-	im
6508	NC_ORIENTATION	US word	NC orientation selection	0 ~ 1 (0)	-	im
6509	POLE_POSITION_ COMP_SEL	US word	Selection of pole position compensation function	0 ~ 1 (0)	-	im
6510	TWICE_SPEED_ SELECTION	US word	n1002 times selection	0 ~ 1 (0)	-	im
6511	EMERGENCY_STOP_ TIME	US word	Time waiting for emergency stop signal	0 ~ 10000 (10000)	ms	im

6520	MULTI_FUNCTION_SEL_TLL	US word	Multi-function selection TLL	0 ~ 2 (0)	-	im
6521	MULTI_FUNCTION_SEL_TLH	US word	Multi-function selection TLH	0 ~ 1 (0)	-	im
6522	MULTI_FUNCTION_SEL_SSC	US word	Multi-function selection SSC	0 ~ 1 (1)	-	im
6523	MULTI_FUNCTION_SEL_MGX	US word	Multi-function selection MGX	0 ~ 1 (0)	-	im
6524	MULTI_FUNCTION_SEL_RDY	US word	Multi-function selection RDY	0 ~ 1 (0)	-	im
6525	CONTROL_REF_CYCLE_TIME	US word	Control instruction cycle time	0 ~ 20 (0)	ms	im
6526	H_GEAR_SEL	US word	Bank when selecting H gear	0 ~ 2 (0)	-	im
6527	M_GEAR_SEL	US word	Bank when selecting M gear	0 ~ 2 (0)	-	im
6528	L_GEAR_SEL	US word	Bank when selecting L gear	0 ~ 2 (0)	-	im
6529	ENCODER_SPECIFICATIONS_0	US word	Encoder specifications (0)	0000 ~ 00FF (0)	-	im
6530	ENCODER_SPECIFICATIONS_1	US word	Encoder specifications (1)	0000 ~ 00FF (0)	-	im
6531	CONTROL_SPECIFICATIONS_0	US word	Control specifications (0)	0000 ~ 00FF (0)	-	im
6532	POSITIONING_TIME	US word	Positioning time	0000 ~ 00FF (0)	-	im
6533	NUMBER_OF_ENCODER_PULS_0	US word	Number of encoder pulse (0)	1 ~ 90000 (12)	-	im
6534	NUMBER_OF_ENCODER_PULS_1	US word	Number of encoder pulse (1)	0 ~ 0 (0)	-	im
6535	REFERENCE_UNIT_0	US word	Instruction unit (0)	0 ~ 0 (0)	-	im
6536	REFERENCE_UNIT_1	US word	Instruction unit (1)	0 ~ 0 (0)	-	im
6540	ENC_PHASE_C_PLUS_WIDTH	US word	C phase pulse width	0 ~ 100 (0)	pulse	im
6550	RESERVED_2	US word	Spare	0 ~ 0 (0)	-	im
6700	BASE_SPEED_1	US word	Base speed	10 ~ 60000 (1500)	r/min	po
6701	MAX_OUTPUT_DECREASE_START_1	US word	Start point of maximum output decrease	10 ~ 60000 (3500)	r/min	po
6702	RATED_SPEED_1	US word	Rated output speed	10 ~ 60000 (3500)	r/min	po
6703	MAXIMUM_SPEED_1	US word	Motor maximum speed	100 ~ 65000 (3500)	r/min	po
6704	CONTINUOUS_RATED_OUTPUT_1	US word	Continuous rated output	1 ~ 750 (22)	0.1kW	po
6705	SHORT_TIME_RATED_OUTPUT_1	US word	Short time rated output	1 ~ 750 (37)	0.1kW	po
6706	MAX_OUTPUT_1	US word	Maximum output	1 ~ 1500 (44)	0.1kW	po
6707	MAX_OUTPUT_DEC_1	US word	Maximum output decrease 1	1 ~ 1500 (44)	0.1kW	po
6708	CONT_OUTPUT_DEC_A1	US word	Maximum output decrease A1	1 ~ 750 (22)	0.1kW	po

6709	SHORT_TIME_OUTPUT_DEC_A1	US word	Short time output decrease A1	1 ~ 750 (37)	0.1kW	po
6710	MAX_OUTPUT_DEC_A1	US word	Maximum output decrease A1	1 ~ 1500 (44)	0.1kW	po
6711	MOTOR_RATED_SLIP_1	US word	Rated slipping frequency	0 ~ 4000 (169)	0.01Hz	po
6712	MOTOR_RATED_CURRENT_1	US word	Rated secondary current	10 ~ 4000 (134)	0.1A	po
6713	MOTOR_NO-LOAD_CURRENT_1	US word	Rated excitation current instruction	10 ~ 2000 (135)	0.1A	po
6714	BASE_VOLTAGE_1	US word	Motor no-load voltage	0 ~ 500 (80)	V	po
6715	MOTOR_IRON_SAT_COEFF_A1	US word	Excitation current compensation factor A	0 ~ 250 (100)	0.01	po
6716	MOTOR_IRON_SAT_COEFF_B1	US word	Excitation current compensation factor B	0 ~ 250 (100)	0.01	po
6717	BASE_IRON_LOSS_1	US word	Base iron loss current	0 ~ 200 (0)	-	po
6718	MAX_IRON_LOSS_2	US word	Maximum revolution iron loss current	0 ~ 200 (0)	-	po
6719	ACR_P_GAIN_A1	US word	ACR gain A	0 ~ 600 (50)	0.01	po
6720	ACR_P_GAIN_B1	US word	ACR gain B	0 ~ 600 (50)	0.01	po
6721	ACR_P_GAIN_C1	US word	ACR gain C	0 ~ 600 (50)	0.01	po
6722	ACR_P_GAIN_D1	US word	ACR gain D	0 ~ 600 (50)	0.01	po
6723	ACR_TIME_CONSTANT_1	US word	ACR time constant	0 ~ 1000 (200)	-	po
6724	MGNETIGING_CURRENT_LIMIT_1	US word	Excitation current limiter	0 ~ 200 (100)	%	po
6725	BASE_SPEED_RATIO_1	US word	Base speed ratio in strong magnetic field	100 ~ 150 (100)	0.01	po
6726	SLIP_FREQUENCY_COMP_START_1	US word	Start point of slip frequency compensation	0 ~ 250 (10)	0.1	po
6727	SLIP_FREQUENCY_COMP_COEFF_1	US word	Slip frequency compensation factor	50 ~ 255 (100)	0.01	po
6728	CARRIER_FREQUENCY_1	US word	Carrier frequency	20 ~ 200 (50)	-	po
6729	MOTOR_ACCEL_LEVEL_1	US word	Motor acceleration level	100 ~ 150 (120)	%	po
6730	SELECTION_CODE_11	Word	Selection code 11	0000 ~ 000F (0000)	-	po
6731	SELECTION_CODE_21	Word	Selection code 21	0000 ~ 000F (0000)	-	po
6732	SELECTION_CODE_31	Word	Selection code 31	0000 ~ 000F (0000)	-	po
6736	TERM_RESISTANCE_1	US word	Resistance between motor lines	0000 ~ 000F (0000)	-	po
6737	LEAK_INDUCTANCE_d1	US word	d axis inductance	0 ~ 60000 (500)	-	po
6738	LEAK_INDUCTANCE_q1	US word	q axis inductance	0 ~ 60000 (500)	-	po
6739	MAGNETIGING_CURRENT_1	US word	Weal magnetic field current	0 ~ 250 (0)	%	po
6740	BASE_FREQUENCY	US word	Base frequency	0 ~ 10000 (1000)	0.1Hz	po
6741	MID_OUTPUT_FREQUENCY	US word	Intermediate frequency	0 ~ 10000 (500)	0.1Hz	po
6742	MID_OUTPUT_FREQUENCY_VOLT	US word	Intermediate output frequency voltage	0 ~ 5000 (130)	0.1V	po

6743	MIN_OUTPUT_ FREQUENCY	US word	Minimum output frequency	0 ~ 10000 (5)	0.1Hz	po
6744	MIN_OUTPUT_ FREQUENCY_VOLT	US word	Minimum output frequency voltage	0 ~ 5000 (100)	0.1V	po
6745	MAX_OUTPUT_ FREQUENCY_VOLT	US word	Maximum output frequency voltage	0 ~ 5000 (2000)	0.1V	po
6750	BASE_SPEED_2	US word	Base speed	10 ~ 60000 (1500)	r/min	po
6751	MAX_OUTPUT_ DECREASE_START_2	US word	Start point of maximum output decrease	10 ~ 60000 (3500)	r/min	po
6752	RATED_SPEED_2	US word	Rated output speed	10 ~ 60000 (3500)	r/min	po
6753	MAXIMUM_SPEED_2	US word	Motor maximum speed	100 ~ 65000 (3500)	r/min	po
6754	CONTINUOUS_RATED_ OUTPUT_2	US word	Continuous rated output	1 ~ 750 (22)	0.1kW	po
6755	SHORT_TIME_RATED_ OUTPUT_2	US word	Short time rated output	1 ~ 750 (37)	0.1kW	po
6756	MAX_OUTPUT_2	US word	Maximum output	1 ~ 1500 (44)	0.1kW	po
6757	MAX_OUTPUT_DEC_2	US word	Maximum output decrease 2	1 ~ 1500 (44)	0.1kW	po
6758	CONT_OUTPUT_DEC_A2	US word	Continuous output decrease A2	1 ~ 750 (22)	0.1kW	po
6759	SHORT_TIME_OUTPUT_ DEC_A2	US word	Short time output decrease A2	1 ~ 750 (37)	0.1kW	po
6760	MAX_OUTPUT_DEC_A2	US word	Maximum output decrease 2	1 ~ 1500 (44)	0.1kW	po
6761	MOTOR_RATED_SLIP_2	US word	Rated slip frequency	0 ~ 4000 (100)	0.01Hz	po
6762	MOTOR_RATED_ CURRENT_2	US word	Rated secondary current	10 ~ 4000 (200)	0.1A	po
6763	MOTOR_NO-LOAD_ CURRENT_2	US word	Rated excitation current instruction	10 ~ 2000 (100)	0.1A	po
6764	BACE_VOLTAGE_2	US word	Motor no-load voltage	0 ~ 500 (80)	V	po
6765	MOTOR_IRON_SAT_ COEFF_A2	US word	Excitation current compensation factor A2	0 ~ 250 (100)	0.01	po
6766	MOTOR_IRON_SAT_ COEFF_B2	US word	Excitation current compensation factor B2	0 ~ 250 (100)	0.01	po
6767	BACE_IRON_LOSS_2	US word	Base iron loss current	0 ~ 200 (0)	-	po
6768	MAX_IRON_LOSS_2	US word	Maximum revolution iron loss current	0 ~ 200 (0)	-	po
6769	ACR_P_GEIN_A2	US word	ACR gain A	0 ~ 600 (200)	0.01	po
6770	ACR_P_GEIN_B2	US word	ACR gain B	0 ~ 600 (200)	0.01	po
6771	ACR_P_GEIN_C2	US word	ACR gain C	0 ~ 600 (200)	0.01	po
6772	ACR_P_GEIN_D2	US word	ACR gain D	0 ~ 600 (200)	0.01	po
6773	ACR_TIME_CONSTANT_2	US word	ACR time constant	0 ~ 1000 (10)	-	po
6774	MAGNETIGING_ CURRENT_LIMIT_2	US word	Excitation current limiter	0 ~ 200 (100)	%	po
6775	BASE_SPEED_RATIO_2	US word	Base speed ratio in strong magnetic field	100 ~ 150 (100)	0.01	po
6776	SLIP_FREQUENCY_ COMP_START_2	US word	Start point of slip frequency compensation	0 ~ 250 (10)	0.1	po

6777	SLIP_FREQUENCY_ COMP_COEFF_2	US word	Slip frequency compensation factor	50 ~ 255 (100)	0.01	po
6778	CARRIER_FREQUENCY_2	US word	Carrier frequency	20 ~ 200 (50)	-	po
6779	MOTOR_ACCEL_LEVEL_2	US word	Motor acceleration level	100 ~ 150 (120)	-	po
6780	SELECTION_CODE_12	Word	Selection code 12	0000 ~ 000F (0000)	-	po
6781	SELECTION_CODE_22	Word	Selection code 22	0000 ~ 000F (0000)	-	po
6786	TERN_RESISTANCE_2	US word	Resistance between motor lines	0 ~ 65000 (1000)	-	po
6787	LEAK_INDUCTANCE_d2	US word	d axis inductance	0 ~ 60000 (500)	-	po
6788	LEAK_INDUCTANCE_q2	US word	q axis inductance	0 ~ 60000 (500)	-	po
6789	MAGNETIGING_ CURRENT_2	US word	Weak magnetic field current	0 ~ 250 (0)	%	po
6800	KVA_SELECTION	Word	Selection of applicable inverter capacity	0000 ~ 002F (B)	-	po
6801	MOTOR_SELECTION	US word	Motor selection	0 ~ 4 (3)	-	po
6802	NUMBER_OF_MOTOR_ POLES	US word	Number of poles	2 ~ 48 (4)	-	po
6803	MOTOR_OH_DETECTION	US word	Motor overheat detection level	50 ~ 200 (107)	°C	po
6804	BEARING_OH_DET_ LWVEL	US word	Bearing overheat detection level	50 ~ 255 (107)	°C	po
6805	ROTOR_THERMAL_GAIN	US word	Rotor thermal gain	0 ~ 200 (0)	0.01	po
6806	MOTOR_THERMAL_ TIME_CONST	US word	Motor thermal time constant	10 ~ 180 (90)	-	po
6807	MOTOR_INERTIA	US word	Motor inertia	0 ~ 5000 (88)	-	po
6808	PG_PULSE	US word	Motor PG resolution	8 ~ 60000 (1024)	-	po
6809	SELECTION_CODE1	Word	Selection code 1	0000 ~ 000F (03)	-	po
6810	SELECTION_CODE2	Word	Selection code 2	0000 ~ 000F (0000)	-	po
6811	SELECTION_CODE3	Word	Selection code 3	0000 ~ 000F (0000)	-	po
6812	SELECTION_CODE4	Word	Selection code 4	0000 ~ 000F (0000)	-	po
6813	RESERVED_3	Word	Spare	0000 ~ 000F (0000)	-	po
6814	RESERVED_4	Word	Spare	0000 ~ 000F (0000)	-	po
6815	RESERVED_5	Word	Spare	0000 ~ 000F (0000)	-	po
6816	RESERVED_6	Word	Spare	0000 ~ 000F (0000)	-	po
6820	FUNCTION_BASIC_ SWITCH	Word	Function selection basic switch	0000 ~ FFFF (0000)	-	po
6821	FUNCTION_APPLI_ SWITCH1	Word	Function selection application switch 1	0000 ~ FFFF (0000)	-	po
6822	FUNCTION_APPLI_ SWITCH2	Word	Function selection application switch 2	0000 ~ FFFF (1000)	-	po
6823	FUNCTION_APPLI_ SWITCH3	Word	Function selection application switch 3	0000 ~ FFFF (0002)	-	po
6824	FUNCTION_APPLI_ SWITCH4	Word	Function selection application switch 4	0000 ~ FFFF (0000)	-	po
6825	FUNCTION_APPLI_ SWITCH5	Word	Function selection application switch 5	0000 ~ FFFF (0000)	-	im

6828	KP	US word	Position loop gain	1 ~ 2000 (40)	-	im
6832	KP2	US word	2nd position loop gain	1 ~ 2000 (40)	-	im
6833	BIAS	US word	Bias	0 ~ 450 (0)	U/min	im
6834	BIAS_WIDTH_ADDITION	US word	Bias addition width	0 ~ 250 (7)	-	im
6835	FEEDFORWARD	US word	Feed forward	0 ~ 100 (0)	%	im
6836	FF_FILTER_TIME_ CONST	US word	Feed forward filter time constant	0 ~ 6400 (0)	-	im
6837	GAIN_SWITCH	Word	Gain related application switch	0000 ~ FFFF (100)	-	im
6838	MODE_SWITCH_ TORQUE	US word	Mode switch (torque instruction)	0 ~ 800 (200)	%	im
6839	MODE_SWITCH_SPEED	US word	Mode switch (speed instruction)	0 ~ 10000 (0)	r/min	im
6840	MODE_SWITCH_ACCEL	US word	Mode switch (acceleration instruction)	0 ~ 3000 (0)	-	im
6841	MODE_SWITCH_ERROR	US word	Mode switch (deviation pulse)	0 ~ 1000 (0)	-	im
6842	ONLINE_AUTO_ TUNING_SWITCH	Word	On-line auto tuning related switch	0000 ~ FFFF (0010)	-	im
6843	FEEDBACK_ COMPENSATION	US word	Speed feed-back compensation gain	1 ~ 100 (100)	%	im
6844	FEEDBACK_DELAY_ COMP	US word	Speed feed-back DELAY compensation	1 ~ 1000 (100)	%	im
6845	OSC_CONT_TORQ_ DUMPING	US word	Anti-vibration torque dumping gain	1 ~ 1000 (1000)	%	im
6846	OSC_CONT_SPEED_ DUMPING	US word	Anti-vibration speed dumping gain	1 ~ 1000 (200)	%	im
6847	OSC_CONT_LPE	US word	Anti-vibration low-pass filter time constant	0 ~ 65535 (32)	-	im
6848	OSC_CONT_HPF	US word	Anti-vibration high-pass filter time constant	0 ~ 65535 (16)	-	im
6849	CURR_GAIN_DELAYED	US word	Current loop gain delay	20 ~ 100 (100)	%	im
6850	RESERVED_7	US word	Reserved constant (Don't use)	0 ~ 100 (100)	-	im
6851	MODEL_LOOP_GAIN	US word	Model loop gain	1 ~ 2000 (50)	-	im
6852	MODEL_LOOP_GAIN_ COMP	US word	Model loop gain compensation	1 ~ 2000 (1000)	-	im
6853	MODEL_MECHA_ RESONANCE	US word	Model mechanical resonance frequency	1 ~ 150 (50)		im
6854	MODEL_RESONANCE	US word	Model resonance frequency	1 ~ 150 (70)	-	im
6855	MODEL_FF_COMP	US word	Model feed-forward compensation	1 ~ 150 (100)	%	im
6856	MODEL_TORQUE_FF_ COMP	US word	Model torque feed-forward compensation	1 ~ 150 (100)	%	im
6857	KI	US word	Position integration time constant	0 ~ 2000 (0)	ms	im
6858	KD	US word	Position differential time constant	0 ~ 51200 (0)	-	im
6860	DISTURBANCE_ OBSERVER_HPF	US word	Disturbance observer high-pass filter cut-off frequency	0 ~ 250 (0)	Hz	im
6862	DISTURBANCE_ OBSERVER_LPF	US word	Disturbance observer low-pass filter cut-off frequency	0 ~ 250 (0)	Hz	im

6863	OBSERVER_INERTIA_ ABJ	US word	Disturbance observer inertia fine adjustment	0 ~ 60000 (0)	%	im
6864	FUNCTION_SWITCH_1	US word	Function switch 1	0000 ~ FFFF (0000)	-	im
6865	FUNCTION_SWITCH_2	US word	Function switch 2	0000 ~ FFFF (0000)	-	im
6866	SPEED_COMP_ DAMPING_RATE	US word	Speed feed-back compensation dumping rate	0 ~ 2000 (85)	%	im
6867	SPEED_VIBRATION_ ELEMENT	US word	Speed vibration element observer time constant	0 ~ 32767 (0)	Hz	im
6868	OSCLLATION_CONT_ INERTIA	US word	Anti-vibration control load inertia	0 ~ 10000 (100)	%	im
6871	KP3	US word	3rd position loop gain	1 ~ 2000 (400)	-	im
6874	KP4	US word	4th position loop gain	1 ~ 2000 (40)	-	im
6905	POSITION_CONTROL_ SWITCH	Word	Position control instruction selection switch	0000 ~ FFFF (0000)	-	im
6906	PG_DIVIDER	US word	PG division	16 ~ 16384 (16384)	-	im
6907	ELECTRIC_GEAR_ NUMERTOR	US word	Electric gear ratio (numerator)	1 ~ 65535 (4)	-	im
6908	ELECTRIC_GEAR_ DENOMINATOR	US word	Electric gear ratio (denominator)	1 ~ 65535 (0)	-	im
6909	1ST_INDEX_ACCEL_ CONST	US word	1st index acceleration/ deceleration constant	0 ~ 6400 (0)	-	im
6910	MULTI_TURN_LIMIT	US word	Multi-turn limit setting	0 ~ 65535 (65535)	-	im
6911	FULL_CLOSED_PG_ PULSE	US word	Full-closed PG pulse number	513 ~ 32768 (16384)	-	im
6912	POSITION_REF_SWITCH	US word	Position instruction function switch	0000 ~ FFFF (0000)	-	im
6913	1ST_POSITION_ MOVING_AVR	US word	1st position moving average time	0 ~ 6400 (0)	-	im
6914	2ND_POSITION_ MOVING_AVR	US word	2nd position moving average time	0 ~ 6400 (0)	-	im
6915	FULL_CLOSED_PG_ PULSE_L_1	US word	Full-closed PG pulse number/ motor one revolution (lower word)	0000 ~ FFFF (4096)	-	im
6916	FULL_CLOSED_PG_ PULSE_H_1	US word	Full-closed PG pulse number/ motor one revolution (higher word)	0000 ~ FFFF (0000)	-	im
6917	FULL_CLOSED_PG_ PULSE_L_2	US word	Full-closed PG pulse number/ encoder one revolution (lower word)	0000 ~ FFFF (0000)	-	im
6918	FULL_CLOSED_PG_ PULSE_H_2	US word	Full-closed PG pulse number/ encoder one revolution (higher word)	0000 ~ FFFF (0000)	-	im
6919	NUMERATOR_ ELECTRIC_GEAR_L_1	US word	Electric gear ratio numerator (lower word)	0000 ~ FFFF (0001)	-	im
6920	NUMERATOR_ ELECTRIC_GEAR_L_2	US word	Electric gear ratio numerator (higher word)	0000 ~ FFFF (0000)	-	im
6921	DENMINATOR_ ELECTRIC_GEARH_1	US word	Electric gear ratio denominator (lower word)	0000 ~ FFFF (0001)	-	im

6922	DENMINATOR_ ELECTRIC_GEARG_2	US word	Electric gear ratio denominator (higher word)	0000 ~ FFFF (0000)	-	im
6923	1ST_BIAS_INDEX_VEL	US word	1st index acceleration/ deceleration bias	0 ~ 65535 (0)	-	im
6924	2ND_BIAS_INDEX_VEL_ TIME	US word	2nd index acceleration/ deceleration constant	0 ~ 6400 (0)	-	im
6925	2ND_BIAS_INDEX_VEL	US word	2nd index acceleration/ deceleration bias	0 ~ 65535 (0)	-	im
6926	SHAPE_COMPENSATION	US word	Shape compensation constant	0 ~ 25000 (0)	-	im
6927	MFC_SHAPE	US word	MFC shape compensation constant	0 ~ 25000 (0)	-	im
6928	1ST_BACKLASH_COMP	US word	1st backlash compensation	0 ~ 65535 (0)	-	im
6929	1ST_BACKLASH_COMP_ TIME	US word	1st backlash compensation constant	0 ~ 65535 (0)	-	im
6930	2ND_BACKLASH_COMP	US word	2nd backlash compensation	0 ~ 65535 (0)	-	im
6931	2ND_BACKLASH_ COMP_TIME	US word	2nd backlash compensation constant	0 ~ 65535 (0)	-	im
6932	3RD_BACKLASH_ COMP	US word	3rd backlash compensation	0 ~ 65535 (0)	-	im
6933	3RD_BACKLASH_ COMP_TIME	US word	3rd backlash compensation constant	0 ~ 65535 (0)	-	im
6934	SPEED_INSTRUCTION_ GAIN	US word	Speed instruction input gain	150 ~ 3000 (600)	-	im
6935	INTERNAL_SET_ SPEED_1	US word	Internal setting speed 1	0 ~ 10000 (100)	r/min	im
6936	INTERNAL_SET_ SPEED_2	US word	Internal setting speed 2	0 ~ 10000 (200)	r/min	im
6937	INTERNAL_SET_ SPEED_3	US word	Internal setting speed 3	0 ~ 10000 (300)	r/min	im
6938	JOG_SPEED	US word	JOG speed	0 ~ 10000 (500)	r/min	im
6941	SPEED_FILTER	US word	Speed instruction filter time constant	0 ~ 65535 (40)	-	im
6942	SPEED_FB_FILTER	US word	Speed F/B filter time constant	0 ~ 65535 (0)	-	im
6943	TORQUE_INPUT_GAIN	US word	Torque instruction input gain	10 ~ 100 (30)	r/min	im
6944	TORQUE_FILTER_ CONSTANT	US word	1st stage low-pass filter time constant (torque instruction input gain)	0 ~ 65535 (100)	-	im
6945	FORWARD_TORQUE_ LIMIT	US word	Forward torque limit	0 ~ 800 (800)	%	im
6946	REVERSAL_TORQUE_ LIMIT	US word	Reversal torque limit	0 ~ 800 (800)	%	im
6947	EXT_FORWARD_ TORQUE_LIMIT	US word	1st forward side external torque limit	0 ~ 800 (100)	%	im
6948	EXT_REVARSAL_ TORQUE_LIMIT	US word	1st reversal side external torque limit	0 ~ 800 (100)	%	im
6949	EMERGENCY_STOP_ TORQUE	US word	Emergency stop torque	0 ~ 800 (800)	%	im

6950	SPEED_LIMIT	US word	Torque control time speed limit	0 ~ 10000 (10000)	r/min	im
6956	TORQUE_FILTER_ CONSTANT_2	US word	2nd stage low-pass filter time constant	0 ~ 65535 (100)	-	im
6957	TORQUE_FILTER_ CONSTANT_3	US word	3rd stage low-pass filter time constant	0 ~ 65535 (100)	-	im
6958	EXT_FORWARD_ TORQUE_LIMIT2	US word	2nd forward side external torque limit	0 ~ 800 (100)	%	im
6959	EXT_REVERSE_ TORQUE_LIMIT2	US word	2nd reversal side external torque limit	0 ~ 800 (100)	-	im
6960	POSITIONING_ COMPLETED_W	US word	Positioning completion width	0 ~ 250 (7)	-	im
6961	ZERO_CLAMP_LEVEL	US word	Zero clamp level	0 ~ 10000 (10)	r/min	im
6962	ZERO_SPEED_LEVEL	US word	Zero speed level	0 ~ 10000 (20)	r/min	im
6963	SPEED_WINDOW	US word	Speed agreement signal output width	0 ~ 100 (10)	r/min	im
6964	NEAR_WINDOW	US word	NEAR signal width	1 ~ 250 (7)	-	im
6965	OVERFROW_LEVEL	US word	Overflow level	1 ~ 32767 (1024)		im
6966	BKC-OFF_DELAY	US word	Brake instruction-servo off delay time	0 ~ 50 (0)	-	im
6967	BKC_OUT_LEVEL	US word	Brake instruction output speed level	0 ~ 1000 (100)	r/min	im
6968	BKC-OFF_WAIT	US word	Servo-off - Brake instruction wait time	10 ~ 100 (50)	-	im
6969	MOMENTARY_HOLD_ TIME	US word	Momentary hold time	20 ~ 1000 (20)	ms	im
6970	INPUT_SELECTION_1	Word	Input signal selection 1	0000 ~ FFFF (2100)	-	im
6971	INPUT_SELECTION_2	Word	Input signal selection 2	0000 ~ FFFF (6543)	-	im
6972	INPUT_SELECTION_3	Word	Input signal selection 3	0000 ~ FFFF (8888)	-	im
6973	INPUT_SELECTION_4	Word	Input signal selection 4	0000 ~ FFFF (8888)	-	im
6974	OUTPUT_SELECTION_1	Word	Output signal selection 1	0000 ~ FFFF (8888)	-	im
6975	OUTPUT_SELECTION_2	Word	Output signal selection 2	0000 ~ FFFF (0000)	-	im
6976	OUTPUT_SELECTION_3	Word	Output signal selection 3	0000 ~ FFFF (0000)	-	im
6977	RESERVED_8	Word	Reserved constant (Don't use)	0000 ~ FFFF (8888)	-	im
6978	OUTPUT_REVARSE	Word	Output signal reversal setting	0000 ~ FFFF (0000)	-	im
6979	POSITION_WINDOW_1	US word	1st positioning completion width	0 ~ 250 (7)	-	im
6980	POSITION_WINDOW_2	US word	2nd positioning completion width	0 ~ 250 (7)	-	im
6981	POSITION_WINDOW_3	US word	3rd positioning completion width	0 ~ 250 (7)	-	im
6982	TURBULENCE_ TORQUE_LEVEL_1	US word	1st torque turbulence level	0 ~ 800 (0)	%	im
6983	TURBULANCE_ TORQUE_LEVEL_2	US word	2nd torque turbulence level	0 ~ 800 (0)	%	im
6984	TURBULANCE_ TORQUE_LEVEL_3	US word	3rd torque turbulence level	0 ~ 800 (0)	%	im
6985	TURBULANCE_ TORQUE_LEVEL_4	US word	4th torque turbulence level	0 ~ 800 (0)	%	im
6986	COMPLIANCE_TORQUE	US word	Compliance torque	0 ~ 800 (0)	%	im
6988	RESERVED_FOR_ USER_OF	Word	Spare for user OF	0000 ~ FFFF (0000)	-	im

6989	REGENE_RESISTER_ CAPA	US word	Regenerative resister capacity	0 ~ 65535 (0)	-	im
6990	RESERVED_9	US word	System reservation	0 ~ 65535 (0)	-	im
6991	COMMUNICATION_ CONTROL	US word	Communication control	0000 ~ FFFF (0000)	-	im
6992	FUNCTION_SELECTION	US word	Function selection application 6 (soft LS)	0000 ~ FFFF (0000)	-	im
6993	COMMAND_MASK	US word	Command mask	0000 ~ FFFF (0000)	-	im
6994	ZERO_POINT_WIDTH	US word	Zero point position range	0 ~ 250 (10)	-	im
6995	FORWARD_SOFTWARE_ LIMIT_L	US word	Positive side software limit (lower word)	0000 ~ FFFF (0000)	-	im
6996	FORWARD_SOFTWARE_ LIMIT_H	US word	Positive side software limit (higher word)	0000 ~ FFFF (2000)	-	im
6997	REVERSE_SOFTWARE_ LIMIT_L	US word	Negative side software limit (lower word)	0000 ~ FFFF (0000)	-	im
6998	REVERSE_SOFTWARE_ LIMIT_H	US word	Negative side software limit (higher word)	0000 ~ FFFF (E000)	-	im
6999	ABS_ZERO_POINT_ OFFSET_L	US word	Absolute PG zero point position offset (lower word)	0000 ~ FFFF (0000)	-	im
7000	ABS_ZERO_POINT_ OFFSET_H	US word	Absolute PG zero point position offset (higher word)	0000 ~ FFFF (0000)	-	im
7001	FIRST_STEP_LINEAR_ ACCEL	US word	1st step linear acceleration constant	0 ~ 65535 (0)	-	im
7002	SECOND_STEP_LINEAR_ ACCEL	US word	2nd step linear acceleration constant	0 ~ 65535 (100)	-	im
7003	ACCELERATION_ SWITCH_SPEED	US word	Acceleration change speed	0 ~ 65535 (0)	-	im
7004	FIRST_STEP_LINEAR_ DECEL	US word	1st step linear deceleration constant	0 ~ 65535 (0)	-	im
7005	SECOND_STEP_LINEAR_ DECEL	US word	2nd step linear deceleration constant	0 ~ 65535 (100)	-	im
7006	DECELERTION_SWITCH_ SPEED	US word	Deceleration change speed	0 ~ 65535 (0)	-	im
7007	EXP_ACCEL_DECEL_ BIAS	US word	Exponential acceleration/ deceleration bias	0 ~ 32767 (0)	-	im
7008	EXP_ACCEL_DECEL_ TIME	US word	Exponential acceleration/ deceleration constant	0 ~ 5100 (0)	-	im
7009	MOVING_AVERAGE_ TIME	US word	Moving average time	0 ~ 5100 (0)	-	im
7010	OPTION_MONITOR	US word	Option monitor	0000 ~ FFFF (0000)	-	im
7011	FINAL_TRAVEL_ DISTANCE_L	US word	External positioning final travelling distance (lower word)	0000 ~ FFFF (0000)	-	im
7012	FINAL_TRAVEL_ DISTANCE_H	US word	External positioning final travelling distance (higher word)	0000 ~ FFFF (0000)	-	im

7013	ZERO_POINT_RETURN_DIR	US word	Zero point return direction	0 ~ 1 (0)	-	im
7014	ZERO_POINT_RETURN_SPEED_1	US word	Zero point return approach speed 1	0 ~ 65535 (50)	-	im
7015	ZERO_POINT_RETURN_SPEED_2	US word	Zero point return approach speed 2	0 ~ 65535 (5)	-	im
7016	FINALDIST_TO_ZERO_L	US word	Zero point return final travelling distance (lower word)	0 ~ 1 (0)	-	im
7017	FINALDIST_TO_ZERO_H	US word	Zero point return final travelling distance (higher word)	0 ~ 1 (0)	-	im

2.2 Machine data for operator panel

2.2.1 Generally available MDs for operator panel

Num-ber	Name	Data type	Contents	Setting range (default)	Unit	Active
9000	LCD_CONTRAST	Byte	Contrast	0~15(7)	-	po
9002	DISPLAY_MODE	Byte	External monitor (1: Monochrome, 2: Color)	0~2(0)	-	po
9003	FIRST_LANGUAGE	Byte	Foreground language	1~2(1)	-	po
9004		Byte	Display resolution	0~5(3)	-	po
9005	PRG_DEFAULT_DIR	Byte	Program default directory	1~5(1)	-	im
9006	DISPLAY_BLACK_TIME	Byte	Time over which display is black IMD	0~60(0)	min	po
9007	TABULATOR_SIZE	Byte	Length of tabulator	0~30(4)	-	im
9008	KEYBOARD_TYPE	Byte	Keyboard type (0: BT, 1: MFII/ QWERTY)	0~1(0)	min	im
9009	KEYBOARD_STATE	Byte	Shift behavior of keyboard during startup (0: Single, 1: CAPSLOCK)	0~60(0)	-	im
9010	SPIND_DISPLAY_ RESOLUTION	Byte	Display resolution for spindle values	0~5(-)	-	im
9011	DISPLAY_RESOLUTION_ INCH	Byte	Display resolution for INCH system of units	0~5(3)	-	im
9015	DARKTIME_TO_PLC	Byte	Transfer signal: Screen is dark to PLC	0~1(0)	-	im
9016	SWITCH_TO_AREA	Byte	Default power-up menu selectable	10~79(10)	-	im
9020	TECHNOLOGY	Byte	Basic configuration for simulation: 0: No specific assignment 1: Turning machine configuration 2: Milling machine configuration	0~2(1)	-	im
9030	EXPONENT_LIMIT	Byte	Number of places displayed without exponent	0~20(6)	-	po
9031	EXPONENT_SCIENCE	Byte	Technical exponent representation in steps of three	0~1(1)	-	po
9200	USER_CLASS_READ_ TOA	Byte	Protection level, read tool offset (general)	0~7(7)	-	im
9201	USER_CLASS_WRITE_ TOAL_GEO	Byte	Protection level, write tool geometry	0~7(7)	-	im
9202	USER_CLASS_WRITE_ GEO_WEAR	Byte	Protection level, write tool wear data	-	im	
9203	USER_CLASS_WRITE_FINE	Byte	Protection level, write fine	0~7(7)	-	im

9204	USER_CLASS_WRITE_ TOA_SC	Byte	Protection level, change tool sum offsets	0~7(7)	-	im
9205	USER_CLASS_WRITE_ TOA_EC	Byte	Protection levele, change tool setup offsets	0~7(7)	-	im
9206	USER_CLASS_WRITE_ TOA_SUPVIS	Byte	Protection level, change tool monitoring limit values	-	im	
9207	USER_CLASS_WRITE_ TOA_ASSDNO	Byte	Change D No. assigned to tool edge	0~7(7)	-	im
9208	USER_CLASS_WRITE_ MAG_WGROUP	Byte	Change wear group magazine location/magazine	0~7(7)	-	im
9209	USER_CLASS_WRITE_ TOA_ADAPT	Byte	Protection level, write tool adapter data	0~7(7)	-	im
9210	USER_CLASS_WRITE_ 20A	Byte	Protection level, write settable zero offset	0~7(7)	-	im
9211	USER_CLASS_READ_ GUD_LUD	Byte	Protection level, read user variables	0~7(7)	-	im
9212	USER_CLASS_WRITE_ GUD_LUD	Byte	Protection level, write user variables	0~7(7)	-	im
9213	USER_CLASS_ OVERSTORE_HIGH	Byte	Protection level, extended overstore	0~7(7)	-	im
9214	USER_CLASS_WRITE_ RPG_CONDIT	Byte	Protection level, influence program	0~7(7)	-	im
9215	USER_CLASS_WRITE_ SEA	Byte	Protection level, write setting data	0~7(7)	-	im
9216	USER_CLASS_READ_ PROGRAM	Byte	Protection level, read part program	0~7(7)	-	im
9217	USER_CLASS_WRITE_ PROGRAM	Byte	Protection level, enter part program	0~7(7)	-	im
9218	USER_CLASS_SELECT_ PROGRAM	Byte	Protection level, select program	0~7(7)	-	im
9219	USER_CLASS_TEACH_IN	Byte	Protection level TEACH IN	0~7(7)	-	im
9220	USER_CLASS_PRESET	Byte	Protection level PRESET	0~7(7)	-	im
9221	USER_CLASS_CLEAR_RPA	Byte	Protection level, delete R parameter	0~7(7)	-	im
9222	USER_CLASS_WRITE_RPA	Byte	Protection level, write R parameter	0~7(7)	-	im
9223	USER_CLASS_SET_V24	Byte	Protection level for RS 232C (V24) interface parameterization	0~7(7)	-	im
9224	USER_CLASS_READ_IN	Byte	Protection level for reading in data	0~7(7)	-	im
9225	USER_CLASS_READ_CST	Byte	Protection level standard cycles	0~7(0)	-	im
9226	USER_CLASS_READ_CUS	Byte	Protection level user cycles	0~7(7)	-	im
9227	USER_CLASS_SHOW_SBL2	Byte	Skip single block2 (SBL2)	0~7(7)	-	im
9228	USER_CLASS_READ_SYF	Byte	Access stage for selection of directory SYF	0~7(7)	-	im

9229	USER_CLASS_READ_DEF	Byte	Access stage for selection of directory DEF	0~7(7)	-	im
9230	USER_CLASS_READ_BD	Byte	Access stage for selection of directory BD	0~7(7)	-	im

(Note) *With Software Version 5, protection level ranges are introduced in the R parameter display. They provide separate defined protection levels for defined areas with R parameters. The ranges and protection levels can be defined with the following machine data.*

The previous functions of the display machine data
USER_CLASS_CLEAR_RPA and USER_CLASS_WRITE_RPA are retained.
Where ranges overlap, the higher of the two protection levels applies.

9231	USER_CLASS_WRITE_ RPA_1	Byte	Write protection for the first RPA range	0~7(7)	-	im
9232	USER_BEGIN_WRITE_ RPA_1	Byte	Beginning of the first RPA range	0(0)	-	
9233	USER_END_WRITE_ RPA_1	Byte	End of the first RPA range	0(0)	-	im
9234	USER_CLASS_WRITE_ RPA_2	Byte	Write protection for the second RPA range	0~7(7)	-	im
9235	USER_BEGIN_WRITE_ RPA_2	Byte	Beginnig of the second RPA range	0(0)	-	im
9236	USER_END_WRITE_ RPA_2	Byte	End of the second RPA range	0(0)	-	im
9237	USER_CLASS_WRITE_ RPA_3	Byte	Write protection for the third RPA range	0~7(7)	-	im
9238	USER_BEGIN_WRITE_ RPA_3	Byte	Beginning of the third RPA range	0(0)	-	im
9239	USER_END_WRITE_ RPA_3	Byte	End of the third RPA range	0(0)	-	im
9251	USER_CLASS_TM_ SKTLLIST	Byte	User class tool management: shows tool list	0~7(7)	-	im
9252	USER_CLASS_TM_ SKTOOLLOAD	Byte	User class tool management: permits loading of tools	0~7(7)	-	im
9253	USER_CLASS_TM_ SKTOOLUNLOAD	Byte	User class tool management: permits unloading of tools	0~7(7)	-	im
9254	USER_CLASS_TM_ SKTOOLMOVE	Byte	User class tool management permits moving of tools in magazine	0~7(7)	-	im
9256	USER_CLASS_TM_ SKMGLREPR2	Byte	User class tool management permits selection of 2_MagList representation	0~7(7)	-	im

9257	USER_CLASS_TM_ SKMGLREPR3	Byte	User class tool management permits selection of 3_MagList representation	0~7(7)	-	im
9258	USER_CLASS_TM_ SKNCNEWTOOLE	Byte	User class tool management permits creating of new cutting edges in NC	0~7(7)	-	im
9259	USER_CLASS_TM_ SKNCDELTOOL	Byte	User class tool management permits deleting of tools in NC	0~7(7)	-	im
9260	USER_CLASS_TM_ SKMGBUFFER	Byte	User class tool management permits/enables display of buffer store	0~7(7)	-	im
9261	USER_CLASS_TM _SKMGFIND	Byte	User class tool management permits/enables SK search and positioning	0~7(7)	-	im
9262	USER_CLASS_TM_ SKMGLISTLPOS	Byte	User class tool management permits/enables positioning	0~7(7)	-	im
9263	USER_CLASS_TM_ SKMGNEXT	Byte	User class tool management permits/enables SK next magazine	0~7(7)	-	im
9264	USER_CLASS_TM_ SKTLNEWTOOL	Byte	User class tool management permits creating tools in NC	0~7(7)	-	im
9265	USER_CLASS_TM_ SKTLLREPR1	Byte	User class tool management permits selection of 1_TOOLLIST	0~7(7)	-	im
9266	USER_CLASS_TM_ SKTLLREPR2	Byte	User class tool management permits selection of 2_TOOLLIST	0~7(7)	-	im
9267	USER_CLASS_TM_ SKTLLREPR3	Byte	User class tool management permits selection of 3_TOOLLIST	0~7(7)	-	im
9269	USER_CLASS_READ_ DEF	Byte	User class tool management permits/enables find place, load tool list	0~7(7)	-	im
9270	USER_CLASS_TM_ SKCTPLACE	Byte	User class tool management enables SK actual place	0~7(7)	-	im
9271	USER_CLASS_TM_ SKLDTOOLDAT	Byte	User class tool management enables SK ToolData in state loading tools	0~7(7)	-	im
9300	V24_USER_XON	Byte	User: Xon character	00~FF(11)	HEX	im
9301	V24_USER_XOFF	Byte	User: Xoff character	00~FF(13)	HEX	im
9302	V24_USER_EOF	Byte	User: Transmission end character	00~FF(1A)	HEX	im
9303	V24_USER_CONTROLS	Byte	User: Special bits	00000000~ 11111111(01001100)	Bitfield	im
9304	V24_USER_RTS	Byte	User: Cable-controlled	0~1(0:RTS/CTS)	-	im

9305	V24_USER_BAUD	Byte	User: Baud rate (300, 600, 1200, 2400, 4800, 9600, 19200)	0~6(5:9600 baud)	-	im
9306	V24_USER_DATABITS	Byte	User: Data bits	0~1(1: 8 data bits)	-	im
9307	V24_USER_PARITY	Byte	User: Parity bits	0~2(0: None)	-	im
9308	V24_USER_STOPBIT	Byte	Stop bits	0~1 (0:1Stop bits)	-	im
9309	V24_USER_LINE	Byte	RS232C (V24) interface (COM1/COM2)	1~2(1)	-	im
9310	V24_PRINTR_XON	Byte	Printer: Xon character	00~FF(11)	HEX	im
9311	V24_PRINTR_XOFF	Byte	Printer: Xoff character	00~FF(13)	HEX	im
9312	V24_PRINTR_EOF	Byte	Printer: Transmission end character	00~FF(0C)	HEX	im
9313	V24_PRINTR_CONTROLS	Byte	Printer: Special bits	00000000~ 11111111(01001100)	Bitfield	im
9314	V24_PRINTR_RTS	Byte	Printer: Cable-controlled	0~1(0:RTS/CTS)	-	im
9315	V24_PRINTR_BAUD	Byte	Printer: Baud rate (300,600,1200,2400,4800,9600,19200)	0~6(5:9600baud)	-	im
9316	V24_PRINTR_DATABITS	Byte	Printer: Data bits	0~1(1:8data bits)	-	im
9317	V24_PRINTR_PARITY	Byte	Printer: Parity bits	0~2(0:None)	-	im
9318	V24_PRINTR_STOPBIT	Byte	Printer: Stop bits	0~1 (0:1Stop bits)	-	im
9319	V24_PRINTR_LINE	Byte	RS232C (V24) interface (COM1/COM2)	1~2(1)	-	im
9320	V24_PG_PC_PC_XON	Byte	PG: Xon character	00~FF(11)	HEX	im
9321	V24_PG_PC_XOFF	Byte	PG: Xoff character	00~FF(13)	HEX	im
9322	V24_PG_PC_EOF	Byte	PG: Transmission end character	00~FF(1A)	HEX	im
9323	V24_PG_PC_CONTROLS	Byte	PG: Transmission end character	00000000~ 11111111(01000000)	Bitfield	im
9324	V24_PG_PC_RTS	Byte	PG: Cable-controlled	0~1(0:RTS/CTS)	-	im
9325	V24_PG_PC_BAUD	Byte	PG: Baud rate (300, 600, 1200, 2400, 4800, 9600, 19200)	0~6(5:9600baud)	-	im
9326	V24_PG_PC_DATABITS	Byte	PG: Data bits	0~1(1:8 data bits)	-	im
9327	V24_PG_PC_PARITY	Byte	PG: Parity bits	0~2 (0:None)	-	im
9328	V24_PG_PC_STOPBIT	Byte	PG: Stop bits	0~1 (0:1 stop bit)	-	im
9229	V24_PG_PC_LINE	Byte	RS232C(V24) interface (COM1/COM2)	1~2(1)	-	im
9400	TOOL_REF_GEO_AXIS1	Double	Tool length compensation reference, GEO axis 1	(0.0)	-	im
9401	TOOL_REF_GEO_AXIS2	Double	Tool length compensation reference, GEO axis 2	(0.0)	-	im
9402	TOOL_REF_GEO_AXIS3	Double	Tool length compensation reference, GEO axis 3	(0.0)	-	im
9410	TOOL_LOAD_PLACE	US word	Number of load location	(0)	-	po

9411	TM_NUM_MAG	US word	Number of work magazine	(0)	-	po
9412	TM_DEFAULT_TOOLSIZE	US word	Default setting for loading: tool size left	1111~7777(1111)	-	po
9415	TM_DEFAULT_ TOOLPLACESPEC	Byte	Default setting for location type	1~***(1)	-	im
9416	TM_DEFAULT_TOOLTYPE	US word	Default setting for loading, tool type	100~900(120)	-	po
9417	TM_DEFAULT_TOOLSTATE	US word	Default setting for loading, tool state	0~256(0)	-	po
9419	TM_DEFAULT_DELETE_ TOOL	Byte	Default setting, Delete tool on unload	0~1(0)	-	po
9420	MA_ONLY_MKS_DIST_ TO_GO	Byte	Distance-to-go display in WCS window 0: WCS value 1: MCS value	0~1(0)	-	po
9421	MA_AXIS_SHOW_ GEO_FIRST	Byte	Show Geo axes of the channel first	0~1(1)	-	im
9422	MA_PRESET_MODE	Byte	Preset 0: No preset 1: Preset 2: Set actual value	0~2(1)	-	im
9423	MA_MAX_SKP_LEVEL	Byte	In the operator panel window program excerpt, subroutines and programs are only displayed up to the level defined in the MD.	1~8(1)	-	im
9424	MA_COORDINATE_ SYSTEM	Byte	Coordinate system for actual value display 0: WCS 1: SZS (settable zero point system)	0~1(0)	-	im
9430	TM_UNLOAD_AND_ DELETE	Byte	Delete tool when unloaded	0~1(0)	-	im
9431	TM_TOOL_NEW	Byte	Tool automatically in load when created	0~1(0)	-	im
9440	ACTIVATE_SEL_USER_ DATA	Byte	Active data (Frames) automatically activated as soon as they are changed	0~1(1)	-	im
9450	MM_WRITE_TOA_FINE_ LIMIT	Double	Limit value for fine tear	(0)	Length	im
9451	MM_WRITE_ZOA_FINE_ LIMIT	Double	Limit value for fine offset	(0)	Length	im
9500	NC_PROPERTIES	Byte	NC properties: Bit 0: digital drives Bit 1: Software start-up switch Bit 2: Reserved	00000000~ 11111111(11111111)	Bitfield	im

9600	CTM_SIMULATION_DEF_X	W word	Simulation default value X	-10000~10000(0)	mm	im
9601	CTM_SIMULATION_DEF_Z	W word	Simulation default value Z	-10000~10000(0)	mm	im
9602	CTM_SIMULATION_DEF_ VIS_AREA	W word	Simulation default value display range	-10000~10000 (100)	mm	im
9603	CTM_SIMULATION_MAX_X	W word	Simulation maximum display X	-10000~10000(0)	mm	im
9604	CTM_SIMULATION_MAX_Z	W word	Simulation maximum display Z	-10000~10000(0)	mm	im
9605	CTM_SIMULATION_MAX_ VIS_AREA	W word	Simulation maximum display range	-10000~10000 (1000)	mm	im
9606	CTM_SIMULATION_ TIME_NEW_POS	Word	Simulation updating rate actual value	0~4000(100)	ms	im
9610	CTM_POS_ COORDINATE_SYSTEM	Byte	Position of coordinate system for technology turning	0~7(2)	-	im
9611	CTM_CROSS_AX_ DIAMETER_ON	Byte	Diameter display for transverse axes active	0~1(1)	-	im
9619	CTM_G91_DIAMETER_ON	Byte	Incremental feed	0~1(0)	-	im
9632	CTM_ANGLE_ REFERENCE_AXIS	Word	Angle reference axis 1: 1st axis 2: 2nd axis	1~2(1)	-	im
9650	CMM_POS_ COORDINATE\SYSTEM	Byte	Position of coordinate system	0~23(0)	-	im

(Note) *The specific settings for the operator panel MDs for the ManualTurn and ShopMill applications are located in the two last subsections.*

9900	MD_TEXT_SWITCH	Byte	Plaintext instead of MD identifier	0~1(0)	Birfield	im
9999	TRACE	Word	Test flags for internal diagnostics	0~FFFF(0)	HEX	po

2.2.2 Application-specific MDs for ManualTurn

(Note) *The MMC 100.2 operator control component or more powerful operator control components are required for the ManualTurn and ShopMill functions.*

9600	CTM_SIMULATION_DEF_X	W word	Simulation default value X	-10000~10000(0)	mm	im
9601	CTM_SIMULATION_DEF_Z	W word	Simulation default value Z	-10000~10000(0)	mm	im
9602	CTM_SIMULATION_ DEF_VIS_AREA	W word	Simulation default value display area	-10000~10000 (100)	mm	im
9603	CTM_SIMULATION_MAX _X	W word	Simulation maximum display X	-10000~10000(0)	mm	im
9604	CTM_SIMULATION_MAX _Z	W word	Simulation maximum display Z	-10000~10000(0)	mm	im
9605	CTM_SIMULATION_ MAX_VIS_AREA	W word	Simulation maximum display area	-10000~10000 (1000)	mm	im
9606	CTM_SIMULATION_ TIME_NEW_POS	Word	Simulation actual value updating rate	0~4000(100)	ms	im

9607	CTM_ENABLE_RAPID_ FEED	Byte	Enable the rapid traverse selection as feedrate	0~1(1)	-	im
9608	CTM_ENABLE_FEED_ P_MIN	Byte	Enable the feedrate selection in mm/min	0~1(1)	-	im
9609	CTM_SPEED_FIELD_ DISPLAY_RES	Byte	Number of decimal places in the speed input field	0~4(0)	-	im
9610	CTM_POS_ COORDINATE_SYSTEM	Byte	Position of the coordinate system	0~7(2)	-	im
9611	CTM_CROSS_AX_ DIAMETER_ON	Byte	Diameter display for active transverse axes	0~1(1)	-	im
9612	CTM_TEACH_STORE_ MANUAL_ABS	Byte	Store setup movements as absolute	0~1(1)	-	im
9613	CTM_TEACH_STORE_ START_ABS	Byte	Store start position as absolute	0~1(1)	-	im
9614	CTM_TEACH_STORE_ MANUAL_AUTO	Byte	Store setup movements automatically	0~1(1)	-	im
9615	CTM_TEACH_HANDW_ FEED	Byte	Handwheel feedrate type	0~2(0)	-	im
9616	CTM_TEACH_HANDW_ FEED_P_MIN	Double	Path feed	1.000~Max feed (10)	mm/ min	im
9617	CTM_TEACH_HANDW_ FEED_P_REV	Double	Rotational feed	0.10~100.0(1)	mm/ rev	im
9618	CTM_ENABLE_C_AXIS	Byte	Enable C axis surface	0~1(1)	-	im
9619	CTM_G91_DIAMETER_ON	Byte	Incremental infeed	0~1(0)	-	im
9620	CTM_CYCLE_ SAFETY_CLEARENCE	Double	ManualTurn cycles safety distance	0.0~10.0(1.0)	-	im
9621	CTM_CYCLE_ DWELL_TIME	Word	Relief cutting time for cycles	-32768~32768(-1)	Negative:S, Positive: U	im
9622	CTM_ENABLE_REPOINT	Byte	Enable reference point approach for ManualTurn	0~1(1)	-	im
9623	CTM_START_ WITHOUT_REFPOINT	Byte	Enable NC start without referenced axes	0~1(1)	-	im
9624	CTM_MODE_SELECT_ BY_SOFTKEY	Byte	Operating mode switchover using vertical softkeys	(0)	-	po
9625	CTM_CUSTOMER_ START_PICTURE	Byte	Customer start picture	(0)	-	po
9626	CTM_TRACE	Byte	Test flags for internal ManualTurn diagnosis	(-)	-	po
9627	CTM_COUNT_GEAR_ STEPS	Byte	Number of gear steps	0~5(1)	-	im
9628	CTM_TOOL_INPUT_ DIAM_ON	Byte	Display the X tool data as diameter	0~1(0)	-	im

9629	CTM_WEAR_INPUT_ DIAM_ON	Byte	Display the X tool wear data as diameter	0~1(0)	-	im
9630	CTM_FIN_SPEED_ PERCENT	Word	Finishing feedrate as percentage	0~100(100)	%	im
9631	CTM_CYCLE_DWELL_ TIME_SEC	Double	Dwell time for cycles in seconds	0~10(1)	sec	im
9632	CTM_ANGLE_ REFERENCE_AXIS	Byte	Angle reference axis	0~1(1)	-	im
9633	CTM_INC_DEC_FEED_ PER_MIN	Double	Increments for feedrate in mm/min (increment/decrement)	0.001~1000(1)	mm/ min	im
9634	CTM_INC_DEC_FEED_ PER_ROT	Double	Increments for feedrate in mm/rev (increment/decrement)	0.001~1(0.1)	mm/ rev	im
9635	CTM_DISPL_RES_ MORE_INCH	Byte	Number of place after decimal point, greater than inch	0~3(1)	-	im
9636	CTM_ENABLE_S_ TOOL_TABLE	Byte	Enable constant cutting speed from tool table	0~1(0)	-	im
9637	CTM_MAX_INP_FEED_ P_MIN	Double	Upper input limit for feedrate in mm/min	0~50000(2000)	mm/ min	im
9638	CTM_MAX_INP_FEED_ P_ROT	Double	Upper input limit for feedrate in mm/rev	0~10(1)	mm/ Umdr.	im
9639	CTM_MAX_TOOL_WEAR	Double	Upper input limit tool wear	0~10(1)	mm	im
9640	CTM_ENABLE_CALC_ THREAD_PITCH	Byte	Calculation of thread depth if pitch has been entered	0~1(0)	-	im
9641	CTM_ENABLE_G_ CODE_INPUT	Byte	Enable G code input	0~1(0)	-	im
9642	CTM_ENABLE_ CIRCLE_HOLE_CYCLE	Byte	Enable drilling of circle of holes	0~1(0)	-	im
9643	CTM_ENABLE_ DRIVEN_TOOL	Byte	Enable support of rotating tools	0~2(0)	-	im
9644	CTM_CIRC_TAP_ DWELL_TIME_1	Double	Dwell time, below, tapping on circle of holes	0~10(0)	sec	im
9645	CTM_CIRC_TAP_ DWELL_TIME_2	Double	Dwell time, above, tapping on circle of holes	0~10(0)	sec	im
9648	CTM_ROUGH_O_ RELEASE_DIST	Double	Retraction distance, stock removal on outside machining	-1~10(1)	mm	im
9649	CTM_ROUGH_I_ RELEASE_DIST	Double	Retraction distance, stock removal on inside machining	-1~10(0,5)	mm	im

2.2.3 Application-specific MDs for ShopMill

9650	CMM_POS_ COORDINATE_SYSTEM	Byte	Position of the coordinate system	0~23(0)	-	im
9651	CMM_TOOL_ MANAGEMENT	Byte	Tool management concept	1~4(2)	-	im
9652	CMM_TOOL_LIFE_ CONTROL	Byte	Tool monitoring	0~1(1)	-	im
9653	CMM_ENABLE_A_AXIS	Byte	Enable 4th axis for the user interface	0~2(0)	-	im
9654	CMM_SPEED_FIELD_ DISPLAY_RES	Byte	Number of decimal places in the speed input field	0~4(0)	-	im
9655	CMM_CYC_PECKING_ DIST	Double	Relief distance during deep-hole drilling	0.0~10.0(1.0)	mm	im
9656	CMM_CYC_DRILL_ RELEASE_DIST	Double	Relief distance during release	0.0~1.0(0.1)	mm	im
9657	CMM_CYC_MIN_ CONT_PO_TO_RAD	Double	Specification of the deviation of the smallest possible cutter radius	0~50(0)	%	im
9658	CMM_CYC_MAX_ CONT_PO_TO_RAD	Double	Specification of the deviation of the largest possible cutter radius	0.0~10.0(0.01)	mm	im
9659	CMM_CYC_DRILL_ RELEASE_ANGLE	Double	Relief angle during release	0~360(0)	Grad	im
9660	CMM_ENABLE_ PLANE_CHANGE	Byte	Switchover to machining level (G17,G18,G19)	0~1(1)	-	im
9661	CMM_ENABLE_ CUSTOMER_M_CODES	Byte	Number of input fields for customer-specific M commands	0~1(1)	-	im
9662	CMM_COUNT_GEAR_ STEPS	Byte	Number of gear steps	0~5(1)	-	im
9663	CMM_TOOL_DISPLAY_ IN_DIAM	Byte	Display radius/diameter for tool	0~1(1)	-	im
9664	CMM_MAX_INP_FEED_ P_MIN	Double	Feedrate in mm/min	0.0~30000.0 (10000.0)	mm/ min	im
9665	CMM_MAX_INP_FEED_ P_ROT	Double	Feedrate in mm/revolution	0.0~10.0(1.0)	mm/ rev	im
9666	CMM_MAX_INP_FEED_ P_TOOTH	Double	Feedrate in mm/tooth	0.0~5.0(1.0)	mm/ tooth	im
9667	FOLLOW_ON_TOOL_ ACTIV	Byte	Tool preselection active	0~1(1)	-	im
9668	CMM_M_CODE_ COOLANT_I_AND_II	Word	M code coolant I and II (-1=no M code)	-1~32767(-1)	-	im
9669	CMM_FACE_MILL_EFF_ TOOL_DIAM	Double	Effective milling diameter for face milling	50.0~100.0(85.0)	%	im

9670	CMM_START_RED_ CONTOUR_POCKET	Double	Radius approach circle for finishing contour packets plus half finishing allowance (-1=safety clearance)	50.0~100.0(-1)	%	im
9671	CMM_DISPL_RES_ MORE_INCH	Byte	Number of place after decimal point, greater than inch	0~33(1)	-	im
9672	CMM_FIXED_TOOL_ PLACE	Byte	Fixed location coding	0~1(0)	-	im
9673	CMM_TOOL_LOAD_ STATION	Byte	Number of loading station	1~2(1)	-	im
9674	CMM_FIXED_TOOL_ MAGAZINE	Byte	Display of magazine list	0~1(1)	-	im
9750	CMM_MEAS_PROBE_ INPUT	Boolean	Measuring input for workpiece probe	(0)	-	im
9751	CMM_MEAS_T_ PROBE_INPUT	Boolean	Measuring input for tool probe	(1)	-	im
9752	CMM_MEASURING_ DISTANCE	Double	Maximum measuring distance (before and after the measuring point) for automatic measuring in the program	1~1000(5)	mm	im
9753	CMM_MEAS_DIST_MAN	Double	Maximum measuring distance for manual measuring (before and after the measuring point)	1~1000(10)	mm	im
9754	CMM_MEAS_DIST_ TOOL_LENGTH	Double	Maximum measuring distance for tool length (before and after the measuring point)	0.1~1000(2)	mm	im
9755	CMM_MEAS_DIST_ TOOL_RADIUS	Double	Maximum measuring distance for tool radius (before and after the measuring point)	0.1~1000(1)	mm	im
9756	CMM_MEASURING_FEED	Double	Measuring feedrate	10~5000(300)	mm/ min	im
9757	CMM_FEED_WITH_ COLL_CTR	Double	Plane feedrate with collision monitoring	10~5000(1000)	mm/ min	im
9758	CMM_POS_FEED_ WITH_COLL_CTRL	Double	Infeed rate with collision monitoring	10~5000(1000)	mm/ min	im
9759	CMM_MAX_CIRC_ SPEED_ROT_SP	Double	Maximum circumferential speed during tool measuring with rotating spindle	1~200(100)	m/ min	im
9760	CMM_MAX_SPIND_ SPEED_ROT_SP	Double	Maximum speed during tool measuring with rotating spindle	100~25000(200)	rpm	im
9761	CMM_MIN_FEED_ROT_ SP	Double	Minimum feedrate during tool measuring with rotating spindle	1~1000(10)	mm/ min	im

9762	CMM_MEAS_TOL_ROT_SP	Double	Measurement accuracy during tool measurement with rotating spindle	0.001~0.1 (0.01)	mm	im
9763	CMM_TOOL_PROBE_TYPE	Word	Tool probe type	0~999(0)	-	im
9764	CMM_TOOL_PROBE_ALLOW_AXIS	Word	Allowed axis directions for tool probe (ZYX)	0~999(133)	-	im
9765	CMM_T_PROBE_DIAM_LENGTH_MEAS	Double	Tool probe diameter for length measurement	0~+(0)	mm	im
9766	CMM_T_PROBE_DIAM_RAD_MEAS	Double	Tool probe diameter for radius measurement	0~+(0)	mm	im
9767	CMM_T_PROBE_DIST_RAD_MEAS	Double	Infeed distance of tool probe upper edge for radius measurement	0~+(0)	mm	im
9768	CMM_T_PROBE_APPROACH_DIR	Byte	Plane approach direction, tool to the tool probe	-2~2(-1)	-	im

2.3 GENERAL MACHINE DATA

2.3.1 System Setting

Number	Name	Data type	Contents		Setting range (Default)	Unit	Active
10000	AXCONF_MACHAX_ NAME_TAB[n]:0...max. No.axes in sys.-1	String	Machine axis name		(X1,Y1,A1,A1, , , , , , , , ...)	-	po
10002	AXCONF_LOGIC_ MACHAX_TUB[n]:0...max. No.axes in sys.-1	String	Logical NCK machine axis image		(AX1,AX2,AX3,...)	-	po
10010	ASSIGN_CHAN_TO_ MODE_GROUP[n]:0...max. No.chann. in sys.-1	D word	Channel valid in mode group		0 ~ 1(1,0,0,0,0,0, 0,0,0,0,0,...)	-	po
10050	SYSCLOCK_CYCLE_ TIME	Double	System clock cycle	Always		sec	po
				NCU571	0.002 ~ 0.031 (0.006)		
				NCU572	0.000125 ~ 0.031 (0.004)		
				NCU573	0.000125 ~ 0.031 (0.004)		
				NCU573, Channel>1	0.000125 ~ 0.031 (0.004)		
				NCU573, Channel>2	0.000125 ~ 0.031 (0.008)		
				810D	0.000625 ~ 0.04 (0.0025)		
				810D_2	0.000625 ~ 0.04 (0.0025)		
10060	POSCTRL_SYSCLOCK_ TIME_RATIO	D word	Factor for position control cycle	Always	1 ~ 31(1)	MD10050	po
				NCU570	1 ~ 1(1)		
10061	POSCTRL_CYCLE_TIME	Double	Position control cycle		(0.0)	-	po
10062	POSCTRL_CYCLE_ DELAY	Double	Position control cycle offset		0.0005 ~ 0.008 (0.0005)	-	po
10070	IPO_SYSCLOCK_TIME_ RATIO	D word	Factor for interpolation cycle	Always	1 ~ 100	MD10050	po
				NCU572, 573	1 ~ 100(3)		
				NCU571	1 ~ 100(3)		
				810D	1 ~ 100(4)		
10071	IPO_CYCLE_TIME	Double	Interpolation cycle		(0.0)	-	po
10072	COM_IPO_TIME_RATIO	Double	Division ratio between interpolation and communication task		1 ~ 100(1)	-	po

10080	SYSCLOCK_SAMPL_ TIME_RATIO	D word	Division factor of position control cycle for actual value sensing	Always		-	po
				NCU572	1 ~ 31(4)		
				NCU573	1 ~ 31(4)		
				NCU572, 573 Channel>1	1 ~ 31(4)		
				NCU572, 573 Channel>2	1 ~ 31(5)		
				NCU571	1 ~ 31(6)		
				NCU571, 572	1 ~ 31(4)		
				810D	1 ~ 31(2)		
10082	CTRLOUT_LEAD_TIME	Double	Shift of setpoint transfer time		0.0 ~ 100.0(0.0)	%	po
10083	CTRLOUT_LEAD_TIME_ MAX	Double	Max. settable offset of setpoint transfer time		0.0 ~ 100.0(100.0)	%	po
10087	SERVO_FIFO_SIZE	D word	Size of setpoint buffers between interpolator and position controller		2 ~ 4(2)	-	po
10090	SAFETY_SYSCLOCK_ TIME RATIO	D word	Factor for monitoring cycle		1 ~ 50(3)	-	po
10091	INFO_SAFETY_CYCLE_ TIME	Double	Display of monitoring cycle time		(0.0)	sec	po
10092	INFO_CROSSCHECK_ CYCLE_TIME	Double	Display cycle time for cross-check		(0.0)	sec	po
10100	PLC_CYCLIC_TIMEOUT	Double	Maximum PLC cycle time		0.0 ~ +(0.1)	sec	po
10110	PLC_CYCLE_TIME_ AVERAGE	Double	Maximum PLC acknowledgement time		0.0 ~ +(0.2)	sec	po
10120	PLC_RUNNINGUP_ TIMEOUT	Double	Monitoring time for PLC power up		0.0 ~ +(50.0)	sec	po
10130	TIME_LIMIT_NETTO_ COM_TASK	Double	Runtime of communication to MMC	Always	.001 ~ 0.100	sec	po
				NCU572, 573	.001 ~ 0.100 (0.005)		
				NCU571	.001 ~ 0.100 (0.012)		
				810D	.001 ~ 0.100 (0.005)		
10131	SUPPRESS_SCREEN_ REFRESH	Byte	Screen refresh response under overload		0 ~ 2(0)	-	po
10132	MMC_CMD_TIMEOUT	Double	Monitoring time for MMC command in the part program		0.0 ~ 100.0(3.0)	sec	po
10134	MM_NUM_MMC_UNIT	D word	Possible number of simultaneous MMC communication partners	Always	1 ~ 10	-	po
				NCU572, 573	1 ~ 10(6)		
				NCU571	1 ~ 10(3)		
				810D	1 ~ 10(3)		
10140	TIME_LIMIT_NETTO_ DRIVE_TASK	Double	Runtime limit of drive communications sub-task		.001 ~ .5(0.02)	sec	po

10150	PREP_DRIVE_TASK_ CYCLE_RATIO	D word	Factor for communication with drive	Drive start-up, analog	1 ~ 50(30)	-	po
				Start-up analog, Drive, 611D	1 ~ 50(2)		
				611D	1 ~ 50(30)		
				611D	1 ~ 50(2)		
10160	PREP_COM_TASK_ CYCLE_RATIO	D word	Factor for communication with MMC		1 ~ 50(3)	-	po
10190	TOOL_CHANGE_TIME	Double	Tool changing time for simulation		(0)	-	po
10200	INT_INCR_PER_MM	Double	Calculation resolution for linear positions		1 ~1000000000 (1000)	-	po
10210	INT_INCR_PER_DEG	Double	Calculation resolution for angular positions		1 ~ 1000000000 (1000)	-	po
10220	SCALING_USER_DEF_ MASK	D word	Activation of scaling factors		0 ~ 0x1FFF (0x200)	(HEX)	po
10230	SCALING_FACTORS_ USER_DEF[n]:0...12	Double	Scaling factors of physical variables		0.0 ~ + (1.0,1.0, 1.0,1.0,1.0,...)	-	po
10240	SCALING_SYSTEM_IS_ METRIC	Boolean	Basic system metric		(1)	-	po
10250	SCALING_VALUE_INCH	Double	Conversion factor for conversion to INCH system		0.0 ~ + (25.4)	-	po
10260	CONVERT_SCALING_ SYSTEM	Boolean	Enable basic system conversion		(0)	-	po
10290	CC_TDA_PARAM_UNIT [n]:0...9	D word	Physical units of tool data for CC		0 ~ 16 (0,0,0,0,0, 0,0,0,0,0,)	-	po
10292	CC_TOA_PARAM_UNIT [n]:0...9	D word	Physical units of cutting edge data for CC		0 ~ 16 (0,0,0,0,0, 0,0,0,0,0)	-	po
10300	FASTIO_ANA_NUM_ INPUTS	Byte	Number of active analog NCK inputs		0 ~ 8 (0)	-	po
10310	FASTIO_ANA_NUM_ OUTPUTS	Byte	Number of active analog NCK outputs		0 ~ 8 (0)	-	po
10320	FASTIO_ANA_INPUT_ WEIGHT[n]:0...7	D word	Weighting factor for analog NCK inputs		1 ~ 10000000 (10000, 10000, 10000,...)	-	po
10330	FASTIO_ANA_OUTPUT_ WEIGHT[n]:0...7	D word	Weighting factor for analog NCK outputs		1 ~ 10000000 (10000, 10000, 10000,...)	-	po
10350	FASTIO_DIG_NUM_ INPUTS	Byte	Number of active digital NCK input bytes		0 ~ 5 (1)	-	po
10360	FASTIO_DIG_NUM_ OUTPUTS	Byte	Number of active digital NCK output bytes		0 ~ 5 (0)	-	po
10361	FASTIO_DIG_SHORT_ CIRCUIT[n]:0...10	D word	Short circuit of digital inputs and outputs		(0,0,0,0,0,0,0,0,0,0,)	-	po

10362	HW_ASSIGN_ANA_ FASTIN[n]:0...7	D word	Hardware assignment of external analog NCK inputs	0x01000000 ~ 0x011F0801 (0x01000000, 0x01000000, 0x01000000,...)	(HEX)	po
10364	HW_ASSIGN_ANA_ FASTOUT[n]:0...7	D word	Hardware assignment of external analog NCK outputs	0x01000000 ~ 0x011F0801 (0x01000000, 0x01000000, 0x01000000,...)	(HEX)	po
10366	HW_ASSIGN_DIG_ FASTIN[n]:0...9	D word	Hardware assignment of external digital NCK inputs	0x01000000 ~ 0x011F0802 (0x01000000, 0x01000000, 0x01000000,...)	(HEX)	po
10368	HW_ASSIGN_DIG_ FASTOUT[n]:0...3	D word	Hardware assignment of external digital NCK outputs	0x01000000 ~ 0x011F0802 (0x01000000, 0x01000000, 0x01000000,...)	(HEX)	po
10380	HW_UPDATE_RATE_ FASTIO[n]:0...max.No. terminal blocks-1	Byte	Updating rate of clocked external NCK I/Os	2 ~ 3 (2,2,2,2,3)	-	po
10382	HW_LEAD_TIME_ FASTIO[n]:0...max.No. terminal blocks-1	D word	Lead time of clocked external NCK I/Os	0.0 ~ + (100,100, 100,100,100)	us	po
10384	HW_CLOCKED_ MODULE_MASK [n]:0...max.No.terminal blocks-1	Byte	Synchronous processing of external NCK I/Os	(0,0,0,0,0,)	(HEX)	po
10390	SAFE_IN_HW_ASSIGN [n]:0...3	D word	Input assignment ext. interface SPL	(0,0,0,0,0,0,0,0)	-	po
10392	SAFE_OUT_HW_ ASSIGN[n]:0...7	D word	Output assignment ext. interface SPL	(0,0,0,0,0,0,0,0)	-	po
10394	PLCIO_NUM_BYTES_IN	Byte	Number of directly readable input bytes of the PLC I/Os	0 ~ MD_MAXNUM_ PLCIO_BYTE_IN (0)	-	po
10395	PLCIO_LOGIC_ ADDRESS_IN	D word	Start address of the directly readable input bytes of the PLC I/Os	0.0 ~ + (0)	-	po
10396	PLCIO_NUM_BYTES_ OUT	Byte	Number of directly writable output bytes of the PLC I/Os	0 ~ MD_MAXNUM_ PLCIO_BYTE_OUT (0)	-	po
10397	PLCIO_LOGIC_ ADDRESS_OUT	D word	Start address of the directly writable output bytes of the PLC I/Os	0.0 ~ + (0)	-	po
10400	CC_VDI_IN_DATA	D word	Number of interface bytes to compile cycles	0 ~ 1024 (0)	Byte	po

10410	CC_VDI_OUT_DATA	D word	Number of interface bytes from compile cycles	0 ~ 1024 (0)	Byte	po
10420	CC_ASSIGN_FASTOUT_ MASK	D word	Reservation of external outputs for CC application	(0)	(HEX)	po
10430	CC_HW_DEBUG_MASK	D word	Hardware debug screenform for compile cycles	(0)	(HEX)	po
10450	SW_CAM_ASSIGN_TUB [n]:0...max.No.SW cams-1	Byte	Assignment software cams to machine axes	0 ~ 31 (0,0,0,0,0,0,...)	-	po
10460	SW_CAM_MINUS_ LEAD_TIME[n]:0...max. No.SW cams-1	Double	Lead or delay time at minus cams 1-16	(0.0,0.0,0.0,...)	sec	po
10461	SW_CAM_PLUS_LEAD_ TIME[n]:0...max.No.SW cams-1	Double	Lead or delay time at plus cams 1-16	(0.0,0.0,0.0,...)	sec	po
10470	SW_CAM_ASSIGN_ FASTOUT_1	D word	Hardware assignment for output of cams 1-8 to NCK I/Os	(0)	(HEX)	po
10471	SW_CAM_ASSIGN_ FASTOUT_2	D word	Hardware assignment for output of cams 9-16 to NCK I/Os	(0)	(HEX)	po
10472	SW_CAM_ASSIGN_ FASTOUT_3	D word	Hardware assignment for output of cams 17-24 to NCK I/Os	(0)	(HEX)	po
10473	SW_CAM_ASSIGN_ FASTOUT_4	D word	Hardware assignment for output of cams 25-32 to NCK I/Os	(0)	(HEX)	po
10480	SW_CAM_TIMER_ FASTOUT_MASK	D word	Screenform for output of cam signals via timer interr. to NCU	(0)	(HEX)	po
10530	COMPAR_ASSIGN_ ANA_INPUT_1[n]:0...7	Byte	Hardware assignment of analog inputs for comparator byte 1	(0,0,0,0,0,0,0,0)	-	po
10531	COMPAR_ASSIGN_ ANA_INPUT_2[n]:0...7	Byte	Hardware assignment of analog inputs for comparator byte 2	(0,0,0,0,0,0,0,0)	-	po
10540	COMPAR_TYPE_1	D word	Parameterization for comparator type 1	(0)	(HEX)	po
10541	COMPAR_TYPE_2	D word	Parameterization for comparator type 2	(0)	(HEX)	po
10600	FRAME_ANGLE_INPUT_ MODE	Byte	Input type for rotation with FRAME (1:RPY, 2:Euler angle)	1 ~ 2 (1)	-	po
10610	MILLOR_REF_AX	Byte	Reference axis for FRAME elements	0 ~ 3 (1)	-	po
10612	MILLOR_TOGGLE	Byte	Mirror toggle	0 ~ 1 (1)	-	po
10613	NCBFRAME_RESET_ MASK	D word	Active NCU global base frames after reset	0 ~ 0xFF (0xFF)	-	re
10620	EULER_ANGLE_NAME_ TAB[n]:0...2	String	Name of Euler angle	(A2,B2,C2)	-	po
10630	NORMAL_VECTOR_ NAME_TAB[n]:0...5	String	Name of normal vectors	(A4,B4,C4,A5,B5, C5)	-	po
10640	DIR_VECTOR_NAME_ TAB[n]:0...2	String	Name of direction vectors	(A3,B3,C3)	-	po

10650	IPO_PARAM_NAME_TAB [n]:0...2	String	Name of interpolation parameters		(I,J,K)	- -	po
10652	COUNTER_DEF_ ANGLE_NAME	String	Name of angle for contour definitions		(ANG)	- -	po
10654	RADIUS_NAME	String	Name of radius for contour definitions		(RND)	-	po
10656	CHAMFER_NAME	String	Name of chamfer for contour definitions		(CHR)	-	po
10660	INTERMEDIATE_POINT_ NAME_TAB[n]:0...2	String	Name of intermediate point coordinates for G2/G3		(I1,J1,K1)	-	po
10700	PREPROCESSING_ LEVEL	Byte	Program preprocessing level		0 ~ 15 (1)	-	po
10702	IGNORE_SINGLEBLOCK_ MASK	D word	Prevents stopping at specific blocks in single block mode		0 ~ 0xFFF (0)	-	po
10704	DRYRUN_MASK	Byte	Dry run feedrate activation		0 ~ 1 (0)	-	po
10710	PROG_SD_RESET_ SAVE_TAB[n]:0...29	D word	String data to to updated		(0,0,0,0,0,0,...)	-	po
10712	NC_USER_CODE_CONF_ NAME_TUB[n]:0...199	String	List of reconfigured NC codes	Always	(CROT,,CSCALE,, CMIRROR,,G603,...)	-	po
				NCU572,573	(-)		
				810D_2	(-)		
10720	OPERATING_MODE_ DEFAULT[n]:0...max.No. mode groups-1	Byte	Initial setting of mode after Power On		0 ~ 12 (7,7,7,7,7, 7,7,7,7,7,7)	-	po
10731	JOG_MODE_KEYS_ EDGETRIGGRD	Boolean	Functioning of the JOG keys		(1)	-	po
10880	EXTERN_CNC_SYSTEM	D word	Definition of the control system to be adapted	Non-standard programming language	0 ~ 1(1)	-	po
				Standard programming language	0 ~ 1(0)		
10882	NC_USER_EXTERN_ GCODES_TAB[n]:0...59	String	List of user-specific G commands of an external NC language		(-)	-	po
10900	INDEX_AX_LENGTH_ POS_TAB_1	D word	Number of positions for indexing axis table 1		0 ~ 60 (0)	-	re
10910	INDEX_AX_POS_TAB_1 [n]:0...max.No.indexing pos.-1	Double	Indexing position table 1		(0.,0.,0.,0.,...)	-	re
10920	INDEX_AX_LENGTH_ POS_TAB_2	D word	Number of positions for indexing axis table 2		0 ~ 60 (0)	-	re
10930	INDEX_AX_POS_TAB_2 [n]:0...max.No.indexing pos.-1	Double	Indexing position table 2		(0.,0.,0.,0.,...)	-	re

11100	AUXFU_MAXNUM_ GROUP_ASSIGN	Byte	Number of auxiliary functions distributed amongst auxiliary function groups	1 ~ 50 (1)	-	po
11110	AUXFU_GROUP_SPEC [n]:0...14	Byte	Auxiliary function group specification	(0x81,0x21,0x41, 0x41,0x41,...)	(HEX)	po
11120	LUD_EXTENDED_ SCOPE	Boolean	Active function "program global user data (PUD)"	(0)	-	po
11200	INIT_MD	Byte	Standard machine data loaded at next Power On	(0)	(HEX)	po
11210	UPLOAD_MD_ CHANGES_ ONLY	Byte	MD backup of changed MD only	(0xFF)	-	im
11220	INI_FILE_MODE	Byte	Error response to INI file errors	0 ~ 2 (1)	-	re
11230	MD_FILE_STYLE	Byte	Structure of MD files on "upload"	(3)	-	im
11280	WPD_INI_MODE	Byte	Handling of INI-files in workpiece-directory	0 ~ 1 (0)	-	po
11300	JOG_INC_MODE_ LEVELTRIGGRD	Boolean	INC and REF in log mode	(1)	-	po
11310	HANDWH_REVERSE	Byte	Threshold for direction change handwheel	0.0 ~ + (2)	-	po
11320	HANDWH_IMP_PER_ LATCH[n]:0...max.No. handwheels-1	Double	Handwheel pulses per detent position	(1.,1.,1.)	-	po
11330	JOG_INCR_SIZE_TAB [n]:0...4	Double	Increment size for INC/handwheel	0.0 ~ + (1.,10., 100.,1000.,10000.)	-	po
11340	ENC_HANDWHEEL_ SEGMENT_NR	Byte	3rd handwheel: type of drive	1 ~ 1 (1)	-	po
11342	ENC_HANDWHEEL_ MODULE_NR	Byte	3rd handwheel: drive no./ measurement circuit no.	0 ~ 31	-	po
11344	ENC_HANDWHEEL_ INPUT_NR	Byte	3rd handwheel: input to module/ measurement circuit board	1 ~ 2 (1)	-	po
11346	HANDWH_TRUE_ DISTANSE	Byte	Handwheel default path or velocity	0 ~ 2 (1)	-	po
11380	MONITOR_ADDRESS	D word	Test MD for setting NCK code or data for SINUMERIK Safety integrated address of the memory location which is to be read/written	(0)	-	im
11382	MONITOR_DISPLAY_INT	D word	INTEGER display of the addressed location	(0)	-	im
11384	MONITOR_DISPLAY_ REAL	Double	REAL display of the addressed location	(0.0)	-	im
11386	MONITOR_INPUT_INT	D word	INTEGER input for the addressed location	(0)	-	im
11388	MONITOR_INPUT_REAL	Double	REAL input for addressed location	(0.0)	-	im

11390	MONITOR_INPUT_ STROBE	Byte	Overwrite the addressed location with MONITOR_INT/REAL	0 ~ 2 (0)	-	im
11398	AXIS_VER_SERVER_ SENSITIVE	Byte	Axis-Var server response in error situations	0 ~ 1 (0)	-	po
11400	TRACE_SELECT	D word	Activation of internal trace functions	(0)	-	po
11410	SUPPRESS_ALARM_ MASK	D word	Screenform for supporting special alarm outputs	(0)	-	po
11411	ENABLE_ALARM_MASK	D word	Activation of warnings	(0)	-	re
11412	ALARM_REACTION_ CHAN_NOREADY	Boolean	Alarm response CHAN_NOREADY permitted	(0)	-	po
11413	ALARM_PAR_DISPLAY_ TEXT	Boolean	Alarm parameter as text output	(0)	-	po
11420	LEN_PROTOCOL_FILE	D word	Size of protocol files (kB)	1 ~ 1000000 (1)	-	po
11430	DIG_ASSIGN_DIGITIZE_ TO_ CHAN	D word	Channel definition for digitizing	0 ~ 10 (0)	-	po
11432	DIG_ASSIGN_NUM_OF_ AXES	Byte	Selection of 3-axes or 3+2-axes digitizing	0 ~ 1 (0)	-	po
11450	SEARCH_RUN_MODE	Byte	Parameterization for search run	0 ~ 1 (0)	-	po
11460	OSCILL_MODE_MASK	D word	Mode screenform for asynchronous oscillation	0 ~ 0xFFFF (0x0)	(HEX)	po
11500	PREVENT_SYNACT_ LOCK[n]:0...1	D word	Protected synchronized actions	0 ~ 255 (0,0)	-	po
11600	BAG_MASK	D word	Defines mode group response to ASUP	0 ~ 0x3 (0)	-	po
11602	ASUP_START_MASK	D word	Ignore stop conditions for ASUP	0 ~ 0x7 (0)	-	po
11604	ASUP_START_PRIO_ LEVEL	D word	Priorities for 'ASUP_START_MASK effective'	0 ~ 128 (0)	-	po
11610	ASUP_EDITABLE	D word	Activation of a user-specific ASUP program	0 ~ 3 (0)	-	po
11612	ASUP_EDIT_ PROTECTION_ LEVEL	D word	Protection level of the user-specific ASUP program	0 ~ 7 (2)	-	po
11660	NUM_EG	Byte	No. of possible "Electronic gear boxes"	0.0 ~ + (0)	-	po
11700	PERMISSIVE_FLASH_ TUB[n]:0...5	D word	Codes for NC card	(0,0,0,0, ManufactorCode,...)	-	po

2.3.2 Override Switch Settings

12000	OVR_AX_IS_GRAY_ CODE	Boolean	Axis feedrate override switch Gray-coded	(1)	-	po
12010	OVR_FACTOR_AX_ SPEED[n]:0...30	Double	Evaluation of axis feedrate override switch	0.00 ~ 2.00 (0.00, 0.01, 0.02, 0.04,...)	-	po
12020	OVR_FEED_IS_GRAY_ CODE	Boolean	Path feedrate override switch Gray-coded	(1)	-	po
12030	OVR_FACTOR_ FEEDRATE[n]:0...30	Double	Evaluation of path feedrate override switch	0.00 ~ 2.00 (0.00, 0.01, 0.02, 0.04,...)	-	po
12040	OVR_RAPID_IS_GRAY_ CODE	Boolean	Rapid traverse override switch Gray-coded	(1)	-	po
12050	OVR_FACTOR_RAPID_ TRA[n]:0...30	Double	Evaluation of rapid traverse override switch	0.00 ~ 1.00 (0.00, 0.01, 0.02, 0.04,...)	-	po
12060	OVR_SPIND_IS_GRAY_ CODE	Boolean	Spindle override switch Gray-coded	(1)	-	po
12070	OVR_FACTOR_SPIND_ SPEED[n]:0...30	Double	Evaluation of spindle override switch	0.00 ~ 2.00 (0.5, 0.55, 0.60, 0.65,...)	-	po
12080	OVR_REFERENCE_IS_ PROG_FEED	Boolean	Override reference speed	(1)	-	po
12082	OVR_REFERENCE_IS_ MIN_FEED	Boolean	Specification of the reference of the path override	(0)	-	po
12100	OVR_FACTOR_LIMIT_ BIN	Double	Limitation for binary-coded override switch	0.0 ~ 2.0 (1.2)	-	po
12200	RUN_OVERRIDE_0	Boolean	Traversing response with override 0	(0)	-	po
12202	PERMANENT_FEED [n]:0...3	Double	Fixed feedrate for linear axes	0.0 ~ + (0., 0., 0., 0)	mm/min	re
12204	PERMANENT_ROT_AX_ FEED[n]:0...3	Double	Fixed feedrate for rotary axes	0.0 ~ + (0., 0., 0., 0)	rev/min	re
12205	PERMANENT_SPINDLE_ FEED[n]:0...3	Double	Fixed feedrate for spindles	0.0 ~ + (0., 0., 0., 0)	rev/min	re
12510	NCU_LINKNO	D word	NCU number in an NCU cluster	1 ~ 16 (1)	-	po
12520	LINK_TERMINATION [n]:0...1	Byte	NCU numbers for which bus termination resistances are activated	0 ~ 15 (0, 1)	-	po
12540	LINK_BAUDRATE_ SWITCH	D word	Link bus baud rate	0 ~ 9 (9)	-	po
12550	LINK_RETRY_CTR	D word	Max. no. message frame transmission retries	0 ~ 15 (4)	-	po
12701	AXCT_AXCONF_ASSIGN_ TAB1[n]:0...31	String	List of axes in axis container 1	(, , , , , , , , , , , , , ...)	-	po
12702	AXCT_AXCONF_ASSIGN_ TAB2[n]:0...31	String	Internal interpolation axis name	(, , , , , , , , , , , , , ...)	-	po
12703	AXCT_AXCONF_ASSIGN_ TAB3[n]:0...31	String	Internal interpolation axis name	(, , , , , , , , , , , , , ...)	-	po

12704	AXCT_AXCONF_ASSIGN_ TAB4[n]:0...31	String	Internal interpolation axis name	(, , , , , , , , , , , , , ...)	-	po
12705	AXCT_AXCONF_ASSIGN_ TAB5[n]:0...31	String	Internal interpolation axis name	(, , , , , , , , , , , , , ...)	-	po
12706	AXCT_AXCONF_ASSIGN_ TAB6[n]:0...31	String	Internal interpolation axis name	(, , , , , , , , , , , , , ...)	-	po
12707	AXCT_AXCONF_ASSIGN_ TAB7[n]:0...31	String	Internal interpolation axis name	(, , , , , , , , , , , , , ...)	-	po
12708	AXCT_AXCONF_ ASSIGN_TAB8[n]:0...31	String	Internal interpolation axis name	(, , , , , , , , , , , , , ...)	-	po
12709	AXCT_AXCONF_ ASSIGN_TAB9[n]:0...31	String	Internal interpolation axis name	(, , , , , , , , , , , , , ...)	-	po
12710	AXCT_AXCONF_ ASSIGN_TAB10[n]:0...31	String	Internal interpolation axis name	(, , , , , , , , , , , , , ...)	-	po
12711	AXCT_AXCONF_ ASSIGN_TAB11[n]:0...31	String	Internal interpolation axis name	(, , , , , , , , , , , , , ...)	-	po
12712	AXCT_AXCONF_ ASSIGN_TAB12[n]:0...31	String	Internal interpolation axis name	(, , , , , , , , , , , , , ...)	-	po
12713	AXCT_AXCONF_ ASSIGN_TAB13[n]:0...31	String	Internal interpolation axis name	(, , , , , , , , , , , , , ...)	-	po
12714	AXCT_AXCONF_ ASSIGN_TAB14[n]:0...31	String	Internal interpolation axis name	(, , , , , , , , , , , , , ...)	-	po
12715	AXCT_AXCONF_ ASSIGN_TAB15[n]:0...31	String	Internal interpolation axis name	(, , , , , , , , , , , , , ...)	-	po
12716	AXCT_AXCONF_ ASSIGN_TAB16[n]:0...31	String	Internal interpolation axis name	(, , , , , , , , , , , , , ...)	-	po

2.3.3 Central Drive Data

13000	DRIVE_IS_ACTIVE [n]:0...30	Boolean	Drive activation (611D)		(0)	-	po
13010	DRIVE_LOGIC_NR [n]:0...30	Byte	Logical drive number	611D	0 ~ 31 (1, 2, 3, 4, 5, 6, 0, 0, 0, 0, 0, ...)	-	po
				611D, not 810D	0 ~ 31 (0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, ...)		
13020	DRIVE_INVERTER_ CODE[n]:0...30	D word	Power section code of drive module	611D	(0xE, 0x13, 0x13, 0, 0, 0, 0, 0, 0, ...)	(HEX)	po
				611D, not 810D	(0, 0, 0, 0, 0, 0, ...)		
13030	DRIVE_MODULE_ TYPE [n]:0...30	Byte	Module recognition	611D	0 ~ 10 (6, 6, 6, 6, 6, 6, 1, 1, 1, 1, 1, ...)	-	po
				611D, not 810D	0 ~ 10 (1, 1, 1, ...)		
13040	DRIVE_TYPE[n]:0...30	Byte	Code for drive type (1:FDD, 2:MSD, 3:LIN)	611D	(2, 1, 1, 1, 1, 1,...)	-	po
				611D, not 810D	(1, 1, 1, 1, 1, 1,...)		
				611D, Standard FDD, MSD	0 ~ 2 (1, 1, 1, 1,...)		

13100	DRIVE_DIAGNOSIS [n]:0...8	D word	Diagnosis drive link		(0, 0, 0, 0, 0, 0, 1, 0, 0)	-	po
13200	MEAS_PROBE_LOW_ ACTIVE[n]:0...1	Boolean	Polarity reversal of sensor		(0)	-	po
14504	MAXNUM_USER_DATA_ INT	D word	Number of user data (INT)		0 ~ 256 (0)	-	po
14506	MAXNUM_USER_DATA_ HEX	D word	Number of user data (HEX)		0 ~ 256 (0)	-	po
14508	MAXNUM_USER_DATA_ FLOAT	D word	Number of user data (FLOAT)		0 ~ 32 (0)	-	po
14510	USER_DATA_INT [n]:0...31	D word	User data (INT)		-32768 ~ 32767 (0,0,0,0,0,0,0,0,...)	-	po
14512	USER_DATA_HEX [n]:0...31	D word	User data (HEX)		0 ~ 0xFF (0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, ...)	-	po
14514	USER_DATA_FLOAT [n]:0...31	Double	User data (FLOAT)	Always	-3.40e38 ~ 3.40e38 (0.0, 0.0, 0.0,...)	-	po
		Byte		not 802S	(0, 0, 0, 0, 0, 0,...)		
14516	USER_DATA_PLC_ ALARM[n]:0...31	Byte	User data (HEX)		(0, 0, 0, 0, 0, 0,...)	-	po
17500	MAXNUM_ REPLACEMENT_TOOLS	D word	Maximal number of replacement tools		0~MD_SLMAXNOOFREPLACEMENTTOOL (0)	-	po

2.3.4 System Specific Memory Setting

18000	VDI_UPDATE_IN_ONE_ IPO_CYCLE	Boolean	PLC interface update	Always		-	po
				NCU572, 573	(0)		
				NCU571 810D	(1) (0)		
18040	VERSION_INFO[n]:0...2	String	Version and possibly data of the PCMCIA card, not FM-NC		(-)	-	po
18050	INFO_FREE_MEM_ DYNAMIC	D word	Display data of free dynamic memory		(0)	Byte	po
18060	INFO_FREE_MEM_ STATIC	D word	Display of data of free static memory		(0)	Byte	po
18070	INFO_FREE_MEM_ DPR	D word	Display of data of free memory in DUAL PORT RAM		(0)	Byte	po
18080	MM_TOOL_ MANAGEMENT_MASK	D word	Step-by step memory reservation for tool management		0 ~ 0xFFFF (0x0)	(HEX)	po
18082	MM_NUM_TOOL	D word	Number of tools the NCK can manage (SRAM)		0 ~ MD_SLMAXNOOFTOOLS (30)	-	po
18084	MM_NUM_MAGAZINE	D word	Number of magazine the NCK can manage (SRAM)		0 ~ MD_SLMAXNOOFMAGAZINES (3)	-	po
18086	MM_NUM_MAGAZINE_ LOCATION	D word	Number of magazine locations the NCK can manage (SRAM)		0 ~ MD_SLMAXNOOFMAGLOCATIONS(30)	-	po

18088	MM_NUM_TOOL_ CARRIER	D word	Maximum number of definable tool carriers	0 ~ 99999999 (0)	-	po
18090	MM_NUM_CC_ MAGAZINE_PARAM	D word	Number of magazine data generated and evaluated by the CC (SRAM)	0 ~ MD_ SLNOOFMAGAZINE_	-	po
18092	MM_NUM_CC_MAGLOC_ PARAM	D word	Number of magazine location data generated and evaluated by the CC (SRAM)	PARAM_CC (0) 0 ~ MD_SLNOOF MAGAZINELOC_	-	po
18094	MM_NUM_CC_TDA_ PARAM	D word	Number of tool-specific data per tool for OEM and compile cycle (SRAM)	PARAM_CC (0) 0~MD_SLNOOFTOOL_	-	po
18096	MM_NUM_CC_TOA_ PARAM	D word	Number of data per tool edge for OEM and compile cycle (SRAM)	PARAM_CC (0) 0~MD_SLNOOFCUTTI	-	po
18098	MM_NUM_CC_MON_ PARAM	D word	Number of monitoring data per tool edge for OEM and compile cycle (SRAM)	NGEDGE_PARAM_CC(0) 0~MD_SLNOOFMONIT OR_PARAM_CC (0)	-	po
18100	MM_NUM_CUTTING_ EDGES_IN_TOA	D word	Tool offsets per TOA block (SRAM)	0 ~ 1500 (30)	-	po
18102	MM_TYPE_OF_ CUTTING_EDGE	D word	Type of D No. programming (SRAM)	0 ~ 3 (0)	-	po
18104	MM_NUM_TOOL_ ADAPTER	D word	Tool adapters in TO area	-1~MD_SLMAZNOOFM	-	po
18105	MM_MAX_CUTTING_ EDGE_NO	D word	Max. value of D No.	AGLOCATIONS (-1) 1~MD_SLMAXCUTTIN	-	po
18106	MM_MAX_CUTTING_ EDGE_PERTOOL	D word	Max. number of D No. per tool	GEDGENUMBER (9) 1~MD_SLMAXNOOF CUTTINGEDGESPER	-	po
18108	MM_NUM_SUMCORR	D word	Resulting offsets in TO area (SRAM)	TOOL (9)	-	po
18110	MM_MAX_SUMCORR_ PER_CUTTEDGE	D word	Number of TOA blocks (SRAM)	-1 ~ 9000 (-1) 1 ~ MD_SLMAXSUM	-	po
18112	MM_KIND_OF_ SUMCORR	D word	Properties of resulting offsets in TO area (SRAM)	CORRNUMBER (1) 0 ~ 0x1F (0)	-	po
18118	MM_NUM_GUD_ MODULES	D word	Number of GUD files in active file system (SRAM)	1 ~ 9 (7)	-	po
18120	MM_NUM_GUD_NAMES_ NCK	D word	Number of global user variables (SRAM)	1 ~ 400 (10)	-	po
18130	MM_NUM_GUD_NAMES_ CHAN	D word	Number of channel-specific user variables (SRAM)	1 ~ 400 (10)	-	po
18140	MM_NUM_GUD_NAMES_ AXIS	D word	Number of axis-specific user variables (SRAM)	1 ~ 100 (0)	-	po
18150	MM_GUD_VALUES_ MEM	D word	Memory location for user variables (SRAM)	0.0 ~ + (12)	kB	po
18160	MM_NUM_USER_ MACROS	D word	Number of macros (SRAM)	0.0 ~ + (10)	-	po
18170	MM_NUM_MAX_FUNC_ NAMES	D word	Number of miscellaneous functions (cycles, DRAM)	0.0 ~ + (40)	-	po

18180	MM_NUM_MAX_FUNC_ PARAM	D word	Number of additional parameters for cycle acc. to MD18170 (DRAM)		0.0 ~ + (300)	-	po
18190	MM_NUM_PROTECT_ AREA_NCK	D word	Number of files for machine-related protection zones (SRAM)		0 ~ 10 (0)	-	po
18210	MM_USER_MEM_ DYNAMIC	D word	Dynamic user memory in the DRAM	Always		kB	po
				NCU572			
				NCU572, 573, Channel>1	(3370) (3500)		
				NCU572, 573, Channel>2	(20700)		
				NCU571, Channel>1	(1750)		
				NCU571, Channel>1	(5000)		
				NCU571			
				NCU571, 572 810D	(1750) (3370)		
				810D_2	(2000)		
18220	MM_USER_MEM_DPR	D word	User memory in DUAL PORT RAM (DPR)		(3500) (0)	kB	po
18230	MM_USER_MEM_ BUFFERED	D word	User memory in SRAM		(1950)	kB	po
18240	MM_LUD_HASH_ TABLE_SIZE	D word	Hash table size for user variables (DRAM)		3 ~ 107 (11)	Prime	po
18242	MM_MAX_SIZE_OF_ LUD_VALUE	D word	Maximum field size for LUD variables (DRAM)	NC memory GUD		Byte	po
				GUD, NCU573	240 ~ 8192 (660)		
				NCU memory LUD	240 ~ 8192 (920)		
				LUD, NCU573	240 ~ 8192 (660)		
18250	MM_CHAN_HASH_ TABLE_SIZE	D word	Hash table size for channel-specific data (DRAM)		240 ~ 8192 (920) 3 ~ 193 (7)	Prime	po
18260	MM_NCK_HASH_ TABLE_SIZE	D word	Hash table size for global data (DRAM)		537 ~ 1201 (1201)	Prime	po
18270	MM_NUM_SUBDIR_ PER_DIR	D word	Number of subdirectories (SRAM)		24 ~ 32 (30)	-	po
18280	MM_NUM_FILES_PER_ DIR	D word	Number of files per directory (SRAM)		64 ~ 512 (100)	-	po
18290	MM_FILE_HASH_ TABLE_SIZE	D word	Hash table size for files of a directory (SRAM)		3 ~ 299 (19)	Prime	po
18300	MM_DIR_HASH_ TABLE_SIZE	D word	Hash table size for subdirectories (SRAM)		3 ~ 37 (7)	Prime	po
18310	MM_NUM_DIR_IN_ FILESYSTEM	D word	Number of directories in passive file system (SRAM)		30 ~ 150 (30)	-	po
18320	MM_NUM_FILES_IN_ FILESYSTEM	D word	Number of files in passive file system (SRAM)		64 ~ 512 (100)	-	po

18331	MM_FLASHFILESYS_ MEM[n]:0...7	Byte	Reserved for FFS	(3, 3, CHUNK_	-	po
18342	MM_CEC_MAX_POINTS [n]:0...double max.No. Axes in sys.-1	D word	Maximum number of interpolation points for sag. comp. (SRAM)	SIZE01(64)5,...) 0 ~ 2000 (0, 0, 0, 0, 0, 0, 0, 0, ...)	-	po
18350	MM_USER_FILE_MEM_ MINIMUM	D word	Minimum part program memory (SRAM)	20 ~ 100 (20)	kB	po
18360	MM_EXT_PROG_ BUFFER_SIZE	D word	FIFO buffer size for processing from external source	30 ~ 1000000 (30)	-	po
18362	MM_EXT_PROG_NUM	Byte	Number of program levels which can be simultaneously processed from an external source	0 ~ 13 (1)	-	po
18400	MM_NUM_CURVE_TABS	D word	Number of curve tables		-	po
18402	MM_NUM_CURVE_ SEGMENTS	D word	Number of curve segments	0.0 ~ + (0) 0.0 ~ + (0)	-	po
18404	MM_NUM_CURVE_ POLYNOMS	D word	Number of curve table polynomials	0.0 ~ + (0)	-	po
18500	MM_EXTCOM_TASK_ STACK_SIZE	D word	Stack size for external communications task	4 ~ 20 (17)	-	po
18502	MM_COM_TASK_ STACK_SIZE	D word	Stack size in kb for communication	4 ~ 20 (12)	-	po
18510	MM_SURBO_TASK_ STACK_SIZE	D word	Stack size of servo task (DRAM)	4 ~ 20 (8)	kB	po
18520	MM_DRIVE_TASK_ STACK_SIZE	D word	Stack size of drive task (DRAM)	4 ~ 20 (8)	kB	po
18600	MM_FRAME_FINE_ TRANS	D word	Fine offset with FRAME	0 ~ 1 (1)	-	po
18601	MM_NUM_GLOBAL_ USER_FRAMES	D word	Number of global predefined user frames	0~MD_MAXNUM_	-	po
18602	MM_NUM_GLOBAL_ BASE_FRAMES	D word	Number of global base frames	NCIFRAMES (0) 0~MD_MAXNUM_	-	po
18700	MM_SIZEOF_LINKVAR_ DATA	D word	Size of NCU-link-variable memory	NCBFRAMES (0) 0 ~ 4096 (0)	-	po
18780	MM_NCU_LINK_MASK	D word	Activation of NCU-link communication		-	po
18782	MM_LINK_NUM_OF_ MODULES	D word	Number of NCU\-link modules	0 ~ 1 (0) 2 ~ 16 (2)	-	po
18790	MM_MAX_TRACE_ LINK_POINTS	D word	Size of the trace data buffer for NCU-link	0 ~ 500 (0)	-	po
18792	MM_TRACE_LINK_ DATA_FUNCTION	D word	Specifies the contents of the NCU-link files	0 ~ 0x7FFFFFFF	-	po

18800	MM_EXTERN_ LANGUAGE	D word	Activation of external NC languages:	Non-standard program language	(0) 0x0000 ~ 0x0001 (0x0001)	-	po
				Standard program language	0x0000 ~ 0x0001 (0x0000)		
18900	FPU_ERROR_MODE	D word	System response to FPU calculation error		(0x1)	-	po
18910	FPU_CTRLWORD_INIT	D word	Basic initialization of FPU control word	Not 810D		-	po
				Not 810D, NCU571.2, 572	(0x37F)		
				Not 810D, NCU571	(0xF001000)		
18920	FPU_EXEPTION_MASK	D word	Exception screen form for FPU calculation errors	Not 810D		-	po
				Not 810D, NCU571.2, 572	(0xD)		
				Not 810D, NCU571	(0x0D000000)		

2.4 CHANNEL-SPECIFIC MACHINE DATA

2.4.1 Basic Channel Machine Data

Number	Name	Data type	Contents	Setting range	Unit	Active
20000	CHAN_NAME	String	Channel name	- ~ - (CHAN1, CHAN2, CHAN3, CHAN4, ...)	-	po
20050	AXCONF_GEOAX_ ASSIGN_TAB[n]:0...2	Byte	Assignment of geometry axis to channel axis	0 ~ 18 ({1,2,3}, {0,0,0,}, {0,...})	-	po
20060	AXCONF_GEOAX_ NAME_TAB[n]:0...2	String	Geometry axis name in channel	- ~ - ({X,Y,Z}, {X,Y,Z}, {X,...})	-	po
20070	AXCONF_MACHAX_ USED[n]:0_max_axes_1	Byte	Machine axis number valid in channel	0 ~ 31 ({1,2,3,4, 0,0,0,0,0,0,...})	-	po
20080	AXCONF_CHANAX_ NAME_TAB[n]:0_max_ axes_1	String	Channel axis name in channel	- ~ - ({X,Y,Z,A, B,C,U,...})	-	po
20090	SPIND_DEF_MASTER_ SPIND	Byte	Initial setting of master spindle in channel	1 ~ 15 (1,1,1,...)	-	po
20092	SPIND_ASSIGN_TAB_ ENABLE	Byte	Enable/disable the spindle converter	0 ~ 1 (0,0,0,...)	-	re
20098	DISPLAY_AXIS [n]:0_max_axes_1	D word	Show axis on MMC	- ~ - (0xFFFFFFFF, 0xFFFFFFFF,...)	-	im
20100	DIAMETER_AX_DEF	String	Geometry axis with transverse axis function	- ~ - (-)	<=16 char.	po
20110	RESET_MODE_MASK	D word	Definition of basic control settings after runup and reset	0 ~ 0x7FFF (0x0, 0x0,...)	HEX	re
20112	START_MODE_MASK	D word	Definition of basic control settings after part program start	0 ~ 0x7FFF (0x400, 0x400,...)	HEX	re
20114	MODESWITCH_MASK	D word	Interruption MDA by mode change	0 ~ 0xFFFF (0x0, 0x0,...)	-	re
20116	IGNORE_INHIBIT_ASUP	D word	An interrupt program can be executed despite a read in disable	- ~ - (0,0,0,...)	-	cf
20117	IGNORE_SINGLEBLOCK_ ASUP	D word	An interrupt program is completely executed despite single block	- ~ - (0,0,0,...)	-	cf
20118	GEOAX_CHANGE_RESET	Boolean	Enable automatic geometry axis change	(0)	-	re
20120	TOOL_RESET_VALUE	D word	Tool whose length compensation is selected during runup (reset/end of pp)	0 ~ MD_SLMAX TOOL NUMBER (0,0,0,...)	-	re
20121	TOOL_PRESEL_RESET_ VALUE	D word	Preselected tool on RESET	0 ~ MD_SLMAXTOOL NUMBER (0,0,0,...)	-	re
20122	TOOL_RESET_NAME	Boolean	Definition of the tool with which length compensation is selected on runup/reset	- ~ - (,,...)	-	re
20124	TOOL_MANAGEMENT_ TOOLHOLDER	D word	Tool holder number	0 ~ MD_MAXNUM_ TOOLHOLDERS (0,...)	-	po

20126	TOOL_CARRIER_ RESET_VALUE	D word	Active tool holder on RESET	0.0 ~ plus (0, 0, 0,...)	-	re
20128	COLLECT_TOOL_ CHANGE	Boolean	Tool change picked up in search run	(1)	-	im
20130	CUTTING_EDGE_ RESET_VALUE	D word	Tool edge whose length compensation is selected during runup (reset/end of pp)	0 ~ MD_SLMAXCUTTINGEDGENUMBER (0, 0, 0,...)	-	re
20132	SUMCORR_RESET_ VALUE	D word	Active resulting offset on RESET	0~MD_SLMAXSUMCORRNUMBER (0, 0,...)	-	re
20140	TRAFO_RESET_VALUE	Byte	Transformation data block selected during runup (reset/pp end)	0 ~ 8 (0, 0, 0,...)	-	re
20150	GCODE_RESET_VALUES [n]:0_max_Gcode_1	Byte	Initial setting of G groups	0.0 ~ plus ({2, 0, 0, 1, 0, 1, 1, 1, 0,...})	-	re
20152	GCODE_RESET_MODE [n]:0_max_Gcode_1	Byte	Reset mode of G groups	0 ~ 1 ({CHAN10, 0, 0, 0, 0, 0,...})	-	re
20154	EXTERN_GCODE_ RESET_VALUES[n]:0...30	Byte	Byte Initial setting of G groups	0.0 ~ plus ({1, 1, 1, 2, 1, 1, 1, 3, 4, ...})	-	re
20160	CUBIC_SPLINE_BLOCKS	Byte	Number of blocks for C spline	4 ~ 9 (8, 8, 8, ...)	-	po
20170	COMPRESS_BLOCK_ PATH_LIMIT	Double	Maximum traversing distance of an NC block with compression	0.0 ~ plus (1.0, 1.0, 1.0, ...)	mm	po
20172	COMPRESS_VELO_ TOL	Double	Max. permissible deviation of the path feedrate during compression	0.0 ~ plus (1000.0, 1000.0, ...)	mm/min	po
20200	CHFRND_MAXNUM_ DUMMY_BLOCKS	Byte	Empty blocks with chamfer/radii	0 ~ 15 (3, 3, 3, ...)	-	po
20201	CHFRND_MODE_ MASK	D word	Chamfer/rounding behavior	0 ~ 0xFFFF (0x0, 0x0, 0x0, ...)	-	re
20202	WAB_MAXNUM_ DUMMY_BLOCKS	Byte	Max. no. of blocks w/o traversing movement with SAD	0 ~ MD_PR_WAB_MAX_BLOCK_TOTAL (5, 5, 5, ...)	-	re
20204	WAB_CLEARANCE_ TOLERANCE	Double	Change of direction with SAR	0.0 ~ plus (0.01, 0.01, 0.01, ...)	mm	po
20210	CUTCOM_CORNER_ LIMIT	Double	Maximum angle for compensation blocks with TRC	0.0 ~ 150. (100., 100., 100., ...)	Degree	re
20220	CUTCOM_MAX_DISK	Double	Maximum value for DISC	0.0 ~ 75.0 (50.0, 50.0, 50.0, ...)	Factor	re
20230	CUTCOM_CURVE_ INSERT_LIMIT	Double	Maximum angle for calculation of intersection with TRC	0.0 ~ 150. (10., 10., 10., ...)	-	re
20240	CUTCOM_MAXNUM_ CHECK_BLOCKS	Byte	Blocks for look-ahead contour calculation with TRC	2 ~ 10 (4, 4, 4, ...)	-	re
20250	CUTCOM_MAXNUM_ DUMMY_BLOCKS	Byte	Number of blocks without traversing motion with TRC	0 ~ 5 (3, 3, 3, ...)	-	re
20252	CUTCOM_MAXNUM_ SUPPR_BLOCKS	Byte	Max. block count with compensation suppression	0 ~ 10 (5, 5, 5, ...)	-	re

20254	ONLINE_CUTCOM_ ENABLE	Boolean	Real time tool radius compensation enabled	(0)	-	po
20256	CUTCOM_INTERS_ POLY_ENABLE	Boolean	Intersection procedure for polynomials is possible	(1)	-	po
20260	PATH_IPO_IS_ON_TCP	Boolean	Velocity control with spline	(0)	-	po
20262	SPLINE_FEED_ PRECISION	Double	Permissible relative error of path velocity for spline	0.000001 ~ 1.0 (0.001, 0.001, ...)	Factor	po
20270	CUTTING_EDGE_ DEFAULT	D word	Initial position of tool cutting edge without programming	-2 ~ MD_SLMAXCUTTING EDGENUMBER (1,1,1,...)	-	po
20272	SUMCORR_DEFAULT	D word	Initial position resulting offset without program	-1 ~ MD_SLMAXSUM CORRNUMBER (0, 0, 0, ...)	-	po
20310	TOOL_MANAGEMENT_ MASK	D word	Activation of different types of tool management	0 ~ 0xFFFFF (0x0, 0x0, 0x0, ...)	HEX	po
20320	TOOL_TIME_MONITOR_ MASK	D word	Activation of tool time monitoring for tool in spindle 1…5	- ~ - (0x0, 0x0, 0x0, ...)	HEX	po
20350	TOOL_GRIND_AUTO_ TMON	Byte	Activation of tool monitoring 0/1: Monitoring off/on	0 ~ 1 (0, 0, 0, ...)	-	po
20360	TOOL_PARAMETER_ DEF_MASK	D word	Definition of tool parameters	0 ~ 0xFFFF (0x0, 0x0, 0x0, ...)	-	po
20400	LOOKAH_USE_VELO_ NEXT_BLOCK	Boolean	Look Ahead to programmed following block velocity	(1)	-	po
20430	LOOKAH_NUM_OVR_ POINTS	D word	Number of prepared override velocity characteristics with Look Ahead	0 ~ 2 (1, 1, 1, ...)	-	po
20440	LOOKAH_OVR_POINTS [n]:0...1	Double	Prepared override velocity characteristics with Look Ahead	0.2 ~ 2.0 ({1.0, 0.2}, {1.0, ...}	Factor	po
20450	LOOKAH_RELIEVE_ BLOCK_CYCLE	Double	Relief factor for block cycle time	0.0 ~ plus (0.0, 0.0, 0.0, ...)	Factor	po
20470	CPREC_WITH_FFW	Boolean	Program contour accuracy	(0)	-	po
20500	CONST_VELO_MIN_ TIME	Double	Minimum time with constant velocity	0.0 ~ 0.1 (0.0, 0.0, 0.0, ...)	sec	po
20600	MAX_PATH_JERK	Double	Path-related maximum jerk	0.0 ~ plus (100.0, 100.0, ...)	mm/s^3	cf
20602	CURV_EFFECT_ON_ PATH_ACCEL	Double	Effect path curvature on path dynamic	0. ~ 0.95 (0., 0., 0.,...)	-	cf
20603	CURV_EFFECT_ON_ PATH_JERK	Double	Effect of path curvature on path jerk	0. ~ 0.95 (0., 0., 0.,...)	-	cf
20610	ADD_MOVE_ACCEL_ RESERVE	Double	Acceleration margin for overlaid movements	0. ~ 0.9 (.2,.2,.2,...)	-	po
20620	HANDWH_GEOAX_ MAX_INCR_SIZE	Double	Limitation handwheel increment for geo axes	0.0 ~ plus (0.0,0.0,0.0,...)	mm	po
20621	HANDWH_ORIAX_MAX_ INCR_SIZE	Double	Limiting of handwheel increment for orienting axes	0.0 ~ plus (0.0,0.0,0.0,...)	Degree	po
20622	HANDWH_GEOAX_ MAX_INCR_VSIZE	Double	Path velocity override	0.0 ~ plus (500.0,500.0,...)	mm/min	po

20623	HANDWH_ORIAX_MAX_INCR_VSIZE	Double	Orientation velocity overlay	0.0 ~ plus (6.0,6.0,6.0,...)	rev/min	po
20624	HANDWH_CHAN_STOP_COND	D word	Definition of the response of the handwheel travel to channel-specific VDIISs	0 ~ 0xFFF (0x3FF, 0x3FF,0x3FF,...)	-	po
20700	REFP_NC_START_LOCK	Boolean	NC start disable without reference point	(1)	-	re
20750	ALLOW_G0_IN_G96	Boolean	G0 logic with G96	(1)	-	po
20800	SPF_END_TO_VDI	Byte	End of subroutine to PLC	- ~ - (1,1,1,...)	-	po
21000	CIRCLE_ERROR_CONST	Double	Circle end point monitoring constant	0.0 ~ plus (0.01,0.01,...)	mm	po
21010	CIRCLE_ERROR_FACTOR	Double	Circle end point monitoring factor	0.0 ~ plus (0.001,0.001,...)	Factor	po
21020	WORKAREA_WITH_TOOL_RADIUS	Boolean	Consideration of tool radius for working area limitation	(0)	-	re
21050	CONTOUR_TUNNEL_TOL	Double	Response threshold for contour tunnel monitoring	0.0 ~ plus (0.0,0.0,0.0,...)	mm	cf
21060	CONTOUR_TUNNEL_REACTION	Byte	Reaction when contour tunnel monitoring responds	0 ~ 2 (1,1,1,...)	-	po
21070	CONTOUR_ASSIGN_FASTOUT	Byte	Assignment of an analog output for the output of the contour error	0 ~ 8 (0,0,0,...)	-	po
21080	CUTCOM_PARALLEL_ORI_LIMIT	Double	Limit angle (path tangent/tool orientation) for 3D tool radius compensation	1.0 ~ 89. (3.,3.,3.,...)	Degree	re
21082	CUTCOM_PLANE_ORI_LIMIT	Double	Minimum angle between surface normal and tool orientation when side angle not equal	1.0 ~ 89. (3.,3.,3.,...)	Degree	re
21084	CUTCOM_PLANE_PATH_LIMIT	Double	Minimum angle between surface normal vector and path tangent vector (3D face milling)	1.0 ~ 89. (3.,3.,3.,...)	Degree	re
21090	MAX_LEAD_ANGLE	Double	Maximum value of permitted lead angle for orientation program	0. ~ 80. (80.,80.,80.,...)	Degree	po
21092	MAX_TILT_ANGLE	Double	Maximum value of permitted side angle for orientation program	-80. ~ 80. (80.,80.,80.,...)	Degree	po
21100	ORIENTATION_IS_EULER	Boolean	Angle definition for orientation programming	(1)	-	po
21102	ORI_DEF_WITH_G_CODE	Boolean	Definition of ORI axes with G-code	(0)	-	po
21104	ORI_IPO_WITH_G_CODE	Boolean	G code for interpolation of orientation	(0)	-	po
21110	X_AXIS_IN_OLD_X_Z_PLANE	Boolean	Coordinate system for automatic frame definition	(1)	-	po
21120	ORIAX_TURN_TAB_1 [n]:0...2	Byte	Definition of reference axes for ORI axes	0 ~ 3 ({1,2,3}, {1,2,...})	-	po

21130	ORIAX_TURN_TAB_2 [n]:0...2	Byte	Definition of reference axes for ORI axes	0 ~ 3 ({1,2,3}, {1,2,...})	-	po
21150	JOG_VELO_RAPID_ ORI[n]:0...2	Double	JOG rapid traverse for ORI axes	0.0 ~ plus ({10.0, 10.0,10.0}, {10.0, 10.0,...})	rev/min	re
21155	JOG_VELO_ORI[n]:0...2	Double	JOG ORI axis velocity	0.0 ~ plus ({2.0, 2.0,2.0}, {2.0, 2.0,...)	rev/min	re
21160	JOG_VELO_RAPID_ GEO[n]:0...2	Double	JOG rapid traverse for GEO axes	0. ~ plus ({10000., 10000.,10000.}, {10000.,...)	mm/min	re
21165	JOG_VELO_GEO [n]:0...2	Double	JOG GEO axis velocity	0. ~ plus ({1000., 1000.,1000.,}, {1000.,...)	mm/min	re
21170	ACCEL_ORI[n]:0...2	Double	Acceleration for ORI axes	0.0 ~ plus ({2.0, 2.0,2.0}, {2.0, 2.0,...)	rev/s^2	cf
21200	LIFTFAST_DIST	Double	Traversing distance on rapid lift from contour	0.0 ~ plus (0.1, 0.1,0.1,...)	mm	po
21202	LIFTFAST_WITH_ MIRROR	Boolean	Rapid retract with mirror image machining	(0)	-	po
21210	SETINT_ASSIGN_ FASTIN	D word	HW assignment of external NCK input byte for NC programming interrupts	- ~ - (1,1,1,...)	HEX	po
21220	MULTFEED_ASSIGN_ FASTIN	D word	Assignment input bytes of NCK I/Os for "multiple feedrates in one block"	- ~ - (0,0,0,...)	HEX	po
21230	MULTFEED_STORE_ MASK	Byte	Store input signal of function "Multiple feedrates in one block"	- ~ - (0,0,0,...)	HEX	po
21300	COUPLE_AXIS_1[n]:0...1	Byte	Synchronous spindle pair definition, mach. axis no.: following spindle [0], leading spindle [1]	0 ~ 31 ({0,0,}, {0,0,}, {0,...)	-	po
21310	COUPLING_MODE_1	Byte	Type of coupling in synchronous spindle operation	0 ~ 2 (1,1,1,...)	-	po
21320	COUPLE_BLOCK_ CHANGE_CTRL_1	Byte	Block change behavior in synchronous spindle operation	0 ~ 3 (3,3,3,...)	-	po
21330	COUPLE_RESET_ MODE_1	D word	Coupling abort behavior	0 ~ 0x3FF (1,1,1,...)	-	po
21340	COUPLE_IS_WRITE_ PROT_1	Boolean	Coupling parameters cannot be altered	(0)	-	po

2.4.2 Machine Data for Digitizing Function

21400	DIG_PROT_VERSION[0]	Byte	Version number of digitizing package (SCAN link protocol)	Digitizing	- ~ -	-	po
				Digitizing, 3 axes	- ~ - (2,2,2,...)		
				Digitizing, 3+2 axes	- ~ - (4,4,4,...)		
21420	DIG_L_ORDER	Byte	Axis assignment of probe for digitizing		0 ~ 5 (0,0,0,...)	-	po
21422	DIG_L_OFF_Z	Double	Initial stress in Z direction for probe calibration		- ~ - (1.0,1.0,1.0,...)	mm	po
21424	DIG_L_INKR[n]:0...2	Double	Resolution of probe in digitizing		- ~ - ({1.0,1.0,1.0},{1.0,...})	-	po
21430	DIG_L_MIN	Double	Minimum deflection for digitizing		- ~ - (0.15,0.15,...)	mm	po
21432	DIG_L_NORMAL	Double	Typical deflection value for digitizing		- ~ - (1.,1.,...)	mm	po
21434	DIG_L_NOTAUS	Double	Deflection of probe at which emergency stop has been triggered		- ~ - (2.0,2.0,2.0,...)	mm	po
21436	DIG_L_NOTAUS_EXT	Double	Deflection of probe with extended reflection range at which emergency stop is triggered		- ~ - (3.5,3.5,3.5,...)	mm	po
21440	DIG_DELTAPOS	Double	In-position window for digitizing		0.0 ~ plus (0.01,0.01,0.01,...)	mm	po
21450	DIG_V_EILGANG	Double	Typical rapid traverse velocity when digitizing		0.0 ~ plus (10000., 10000.,10000.,...)	mm/min	po
21460	DIG_A_MAX	Double	Maximum path acceleration when digitizing		0.0 ~ plus (100.,100.,100.,...)	mm/s^2	po
21462	DIG_A_MAX_MOVE	Double	Maximum path acceleration when positioning in digitizing mode		0.0 ~ plus (0,0,0,...)	mm/s^2	po
21464	DIG_A_MAX_SCAN	Double	Maximum path acceleration with digitizing function		0.0 ~ plus (0,0,0,...)	mm/s^2	po
21470	DIG_P_HAND	Double	Proportional factor for manual mode		- ~ - (1)	1000/min	po
21472	DIG_P_SCAN	Double	Proportional factor for probe control		- ~ - (1)	1000/min	po
21474	DIG_T_SCAN	Double	Time constant for probe control		0.0 ~ plus (0.15,0.15,0.15,...)	sec	po
21476	DIG_SENSOR_OFFSET [n]:0...2	Double	Vector from tool holder to feeler holder		- ~ - ({0.0,0.0,0.0},{0.0,...)	mm	po

2.4.3 Machine Data for Grinding Function

21500	TRACLG_GRINDSPI_ VERT_OFFSET	Double	Vertical position offset of grinding axis in centerless grinding	- ~ - (0.,0.,0.,...)	mm	po
21501	TRACLG_GRINDSPI_ HOR_OFFSET	Double	Horizontal position offset of grinding axis in centerless grinding	- ~ - (0.,0.,0.,...)	mm	po
21502	TRACLG_CTRLSPI_ VERT_OFFSET	Double	Vertical position offset of regulating axis in centerless grinding	- ~ - (0.,0.,0.,...)	mm	po
21504	TRACLG_SUPPORT_ VERT_OFFSET	Double	Vertical offset of work blade in centerless grinding	- ~ - (0.,0.,0.,...)	mm	po
21506	TRACLG_SUPPORT_ HOR_OFFSET	Double	Horizontal offset of work blade in centerless grinding	- ~ - (0.,0.,0.,...)	mm	po
21508	TRACLG_VERT_DIR_ SUPPORTAX_1	Double	Vertical component of work blade direction vector for Q1	- ~ - (1.,1.,1.,...)	-	po
21510	TRACLG_HOR_DIR_ SUPPORTAX_1	Double	Horizontal component of work blade direction vector for Q1	- ~ - (0.,0.,0.,...)	-	po
21512	TRACLG_VERT_DIR_ SUPPORTAX_2	Double	Vertical component of work blade direction vector for Q2	- ~ - (0.,0.,0.,...)	-	po
21514	TRACLG_HOR_DIR_ SUPPORTAX_2	Double	Horizontal component of work blade direction vector for Q2	- ~ - (1.,1.,1.,...)	-	po
21516	TRACLG_SUPPORT_ LEAD_ANGLE	Double	Lead angle of work blade in centerless grinding	-90. ~ 90. (0.,0.,0.,...)	Degree	po
21518	TRACLG_CONTACT_ UPPER_LIMIT	Double	Upper contact limit of work blade with work in centerless grinding	- ~ - (0.,0.,0.,...)	mm	po
21520	TRACLG_CONTACT_ LOWER_LIMIT	Double	Lower contact limit of work blade with work in centerless grinding	- ~ - (0.,0.,0.,...)	mm	po
21522	TRACLG_GRINDSPI_NR	Byte	Definition of grinding spindle for centerless grinding	1 ~ 15 (2,2,2,...)	-	po
21524	TRACLG_CTRLSPI_NR	Byte	Definition of regulating spindle for centerless grinding	1 ~ 15 (1,1,1,...)	-	po
21526	TRACLG_G0_IS _SPECIAL	Boolean	Special logic for G0 in centerless grinding	(1)	-	po

2.4.4 Channel Auxiliary Function Settings

22000	AUXFU_ASSIGN_GROUP [n]:0...49	Byte	Auxiliary function group	1 ~ 15 ({1,1,1,...})	-	po
22010	AUXFU_ASSIGN_TYPE [n]:0...49	String	Auxiliary function type	- ~ - ({,,,,,,,,,,})	-	po
22020	AUXFU_ASSIGN_ EXTENSION[n]:0...49	Byte	Auxiliary function extension	0 ~ 99 ({0,0,0,...})	-	po
22030	AUXFU_ASSIGN_VALUE [n]:0...49	D word	Auxiliary function value	- ~ - ({0,0,0,...})	-	po
22100	AUXFU_QUICK_ BLOCKCHANGE	D word	Block change delay with quick auxiliary functions	0 ~ 1 (0,0,0,...)	-	po
22110	AUXFU_H_TYPE_INT	D word	Type of H auxiliary functions is integer	0 ~ 1 (0,0,0,...)	-	po
22200	AUXFU_M_SYNC_TYPE	Byte	Output time of M functions	0 ~ 3 (0,0,0,...)	-	po
22210	AUXFU_S_SYNC_TYPE	Byte	Output time of S functions (See MD22200 for values)	0 ~ 3 (0,0,0,...)	-	po
22220	AUXFU_T_SYNC_TYPE	Byte	Output time of T functions (See MD22200 for values)	0 ~ 3 (0,0,0,...)	-	po
22230	AUXFU_H_SYNC_TYPE	Byte	Output time of H functions (See MD22200 for values)	0 ~ 3 (0,0,0,...)	-	po
22240	AUXFU_F_SYNC_TYPE	Byte	Output time of F functions (See MD22200 for values)	0 ~ 3 (3,3,3,...)	-	po
22250	AUXFU_D_SYNC_TYPE	Byte	Output time of D functions (See MD22200 for values)	0 ~ 3 (0,0,0,...)	-	po
22400	S_VALUES_ACTIVE_ AFTER_RESET	Boolean	S function effective after RESET	(0)	-	po
22410	F_VALUES_ACTIVE_ AFTER_RESET	Boolean	S function effective after RESET	(0)	-	po
22510	GCODE_GROUPS_TO_ PLC[n]:0...7	Byte	G codes output at NCK-PLC interface on block change/RESET	- ~ - ({0,0,0,0,0, 0,0,0}, {0,0,...)	-	po
22512	EXTERN_GCODE_ GROUPS_TO_PLC[n]:0...7	Byte	Send G commands of an external NC language to PLC	- ~ - ({0,0,0,0,0, 0,0,0}, {0,0,...)	-	po
22530	TOCARR_CHANGE_M_ CODE	D word	M code at change of tool carrier	-99999999 ~ 99999999 (0,0,...)	-	po
22532	GEOAX_CHANGE_M_ CODE	D word	M code at change of geo axes	0 ~ 99999999 (0,0,0,...)	-	po
22534	TRAFO_CHANGE_M_ CODE	D word	M code at change of transformation	0 ~ 99999999 (0,0,0,...)	-	po
22550	TOOL_CHANGE_MODE	Byte	New tool compensation for M function	0 ~ 1 (0,0,0,...)	-	po
22560	TOOL_CHANGE_M_ CODE	D word	M function for tool change	0 ~ 99999999 (6,6,6,...)	-	po

22562	TOOL_CHANGE_ ERROR_MODE	D word	Response to tool change errors	0 ~ 0x3 (0x0,0x0,0x0,...)	-	po
22700	TRACE_STARTTRACE_ EVENT	String	Diagnostic data recording starts with the event	- ~ - (-)	-	re
22702	TRACE_STARTTRACE_ STEP[n]:0...1	String	Further condition for starting the trace recording (e.g. block number)	- ~ - ({,},{,}{,...)	-	re
22704	TRACE_STOPTRACE_ EVENT	String	Diagnostic data recording stops with the event TRACE_STARTTRACE_EVENT	- ~ -(CLEARCAN CELALARM_M,...)	-	re
22706	TRACE_STOPTRACE_ STEP[n]:0...1	String	Command Sequence Step with which the recording ends	- ~ - ({,},{,}{,...)	-	re
22708	TRACE_SCOPE_MASK	String	Selects the contents of the trace file	- ~ - (-)	-	re
22710	TRACE_VARIABLE_ NAME[n]:0...8	String	Trace extent of the diagnosis	- ~ - ({BL_NR, TR_POINT,EV_ TYPE,EV_SRC,...)	-	re
22712	TRACE_VARIABLE_ INDEX[n]:0...8	D word	Index for trace recording	0 ~ 0xFFFF ({0x0,0x0,...)	-	re
22714	MM_TRACE_DATA_ FUNCTION	D word	Activating diagnostics	0 ~ 0xFFFF ({0x0,0x0,...)	-	po
22800	TRACE_COMPRESSOR_ OUTPUT	Byte	Activation of trace output for compressor	- ~ - (0,0,0,...)	-	po
24000	FRANE_ADD_ COMPONENTS	Boolean	Frame components for G58 and G59	(0)	-	po
24002	CHBFRAME_RESET_ MASK	D word	Active channel-specific base frames after reset	0 ~ 0xFF (0xFF,0xFF,...)	-	re

2.4.5 Transformation Definitions in Channel

24100	TRAFO_TYPE_1	D word	Definition of transformation 1 in channel	- ~ - (0,0,0,...)	-	po
24110	TRAFO_AXES_IN_1 [n]:0_max_axes_1	Byte	Axis assignment for transformation	0 ~ 18 ({1,2,3,4,5,0,0,0,0,...)	-	po
24120	TRAFO_GEOAX_ASSIGN_ TAB_1[n]:0...2	Byte	Assignment GEO axis to channel axis for transformation 1	0 ~ 18 ({0,0,0,},{0,...)	-	po
24200	TRAFO_TYPE_2	D word	Definition of transformation 2 in channel	- ~ - (0,0,0,...)	-	po
24210	TRAFO_AXES_IN_2 [n]:0_max_axes_1	Byte	Axis assignment for transformation 2	0 ~ 18 ({1,2,3,4,5,0,0,0,0,...)	-	po
24220	TRAFO_GEOAX_ASSIGN_ TAB_2[n]:0...2	Byte	Assignment GEO axis to channel axis for transformation 2	0 ~ 18 ({0,0,0,},{0,...)	-	po
24300	TRAFO_TYPE_3	D word	Definition of transformation 3 in channel	- ~ - (0,0,0,...)	-	po
24310	TRAFO_AXES_IN_3 [n]:0_max_axes_1	Byte	Axis assignment for transformation 3	0 ~ 18 ({1,2,3,4,5,0,0,0,0,...)	-	po

24320	TRAFO_GEOAX_ASSIGN_ TAB_3[n]:0...2	Byte	Assignment GEO axis to channel axis for transformation 3	0 ~ 18 ({0,0,0,},{0,...)	-	po
24400	TRAFO_TYPE_4	D word	Definition of transformation 4 in channel	- ~ - (0,0,0,...)	-	po
24410	TRAFO_AXES_IN_4 [n]:0_max_axes_1	Byte	Axis assignment for transformation 4	0 ~ 18 ({1,2,3,4,5,0,0,0,0,...)	-	po
24420	TRAFO_GEOAX_ASSIGN TAB_4[n]:0...2	Byte	Assignment GEO axis to channel axis for transformation 4	0 ~ 18 ({0,0,0,},{0,...)	-	po
24430	TRAFO_TYPE_5	D word	Definition of transformation 5 in channel	- ~ - (0,0,0,...)	-	po
24432	TRAFO_AXES_IN_5 [n]:0_max_axes_1	Byte	Axis assignment for transformation 5	0 ~ 18 ({1,2,3,4,5,0,0,0,0,...)	-	po
24434	TRAFO_GEOAX_ASSIGN_ TAB_5[n]:0...2	Byte	GEO/channel axis assignment transformation 5	0 ~ 18 ({0,0,0,},{0,...)	-	po
24440	TRAFO_TYPE_6	D word	Definition of transformation 6 in channel	- ~ - (0,0,0,...)	-	po
24442	TRAFO_AXES_IN_6 [n]:0_max_axes_1	Byte	Axis assignment for transformation 6	0 ~ 18 ({1,2,3,4,5,0,0,0,0,...)	-	po
24444	TRAFO_GEOAX_ASSIGN_ TAB_6[n]:0...2	Byte	GEO/channel axis assignment transformation 6	0 ~ 18 ({0,0,0,},{0,...)	-	po
24450	TRAFO_TYPE_7	D word	Definition of transformation 7 in channel	- ~ - (0,0,0,...)	-	po
24452	TRAFO_AXES_IN_7 [n]:0_max_axes_1	Byte	Axis assignment for transformation 7	0 ~ 18 ({1,2,3,4,5,0,0,0,0,...)	-	po
24454	TRAFO_GEOAX_ASSIGN_ TAB_7[n]:0...2	Byte	GEO/channel axis assignment transformation 7	0 ~ 18 ({0,0,0,},{0,...)	-	po
24460	TRAFO_TYPE_8	D word	Definition of transformation 8 in channel	- ~ - (0,0,0,...)	-	po
24462	TRAFO_AXES_IN_8 [n]:0_max_axes_1	Byte	Axis assignment for transformation 8	0 ~ 18 ({1,2,3,4,5,0,0,0,0,...)	-	po
24464	TRAFO_GEOAX_ASSIGN_ TAB_8[n]:0...2	Byte	GEO/channel axis assignment transformation 8	0 ~ 18 ({0,0,0,},{0,...)	-	po
24500	TRAFO5_PART_OFFSET_ 1[n]:0...2	Double	Offset vector of 5-axis transformation 1	- ~ - ({0,0,0,},{0,...)	mm	po
24510	TRAFO5_ROT_AX_ OFFSET_1[n]:0...1	Double	Position offset of rotary axes 1/2 for 5-axis transformation 1	- ~ - ({0,0,0,},{0,...)	Degree	po
24520	TRAFO5_ROT_SIGN_ IS_PLUS_1[n]:0...1	Boolean	Sign of rotary axis 1/2 for 5-axis transformation 1	- ~ - ({1,1},{1,1},...)	-	po
24530	TRAFO5_NON_POLE_ LIMIT_1	Double	Definition of pole range for 5-axis transformation 1	- ~ - (2.0,2.0,2.0,...)	Degree	po
24540	TRAFO5_POLE_LIMIT_1	Double	Double End angle tolerance with interpolation through pole for 5-axis transformation	- ~ - (2.0,2.0,2.0,...)	Degree	po

24550	TRAFO5_BASE_TOOL_1[n]:0...2	Double	Vector of base tool on activation of 5-axis transformation 1	- ~ - ({0.0,0.0,0.0}, {0.0,...)	mm	po
24560	TRAFO5_JOINT_OFFSET_1[n]:0...2	Double	Vector of KINEMATIC OFFSET of 5-axis transformation 1	- ~ - ({0.0,0.0,0.0}, {0.0,...)	mm	po
24562	TRAFO5_TOOL_ROT_AX_OFFSET_1[n]:0...2	Double	Offset of swivel point of 1st rotary axis on 5-axis transformation with swiveled linear	- ~ - ({0.0,0.0,0.0}, {0.0,...)	mm	po
24564	TRAFO5_NUTATOR_AX_ANGLE_1	Double	Angle of inclination of 2nd rotary axis of 1st nutating head transformation	0. ~ 89. (45.0,45.0,...)	Degree	po
24580	TRAFO5_TOOL_VECTOR_ 1	Byte	Direction of orientation vector	0 ~ 2 (2,2,2,...)	-	po
24585	TRAFO5_ORIAX_ASSIGN_TAB_1[n]:0...2	Byte	ORI/channel axis assignment transformation 1	0 ~ 18 ({0,0,0}, {0,...)	-	po
24600	TRAFO5_PART_OFFSET_2[n]:0...2	Double	Offset vector of 5-axis transformation 2	- ~ - ({0.0,0.0,0.0}, {0.0,...)	mm	po
24610	TRAFO5_ROT_AX_OFFSET_2[n]:0...1	Double	Position offset of rotary axes 1/2 for 5-axis transformation 2	- ~ - ({0.0,0.0}, {0.0,...)	Degree	po
24620	TRAFO5_ROT_SIGN_IS_PLUS_2[n]:0...1	Boolean	Sign of rotary axis 1/2 for 5-axis transformation 2	- ~ - ({1,1}, {1,1}, {1,1},...)	-	po
24630	TRAFO5_NON_POLE_LIMIT_2	Double	Definition of pole range for 5-axis transformation 2	- ~ - (2.0,2.0,...)	Degree	po
24640	TRAFO5_POLE_LIMIT_2	Double	End angle tolerance with interpolation through pole for 5-axis transformation	- ~ - (2.0,2.0,...)	Degree	po
24650	TRAFO5_BASE_TOOL_2[n]:0...2	Double	Vector of base tool on activation of 5-axis transformation	- ~ - ({0.0,0.0,0.0}, {0.0,...)	mm	po
24660	TRAFO5_JOINT_OFFSET_2[n]:0...2	Double	Vector of kinematic offset of 5-axis transformation 2	- ~ - ({0.0,0.0,0.0}, {0.0,...)	mm	po
24662	TRAFO5_TOOL_ROT_AX_OFFSET_2[n]:0...2	Double	Offset of swivel point of 2nd 5-axis transformation with swivelled linear axis	- ~ - ({0.0,0.0,0.0}, {0.0,...)	mm	po
24664	TRAFO5_NUTATOR_AX_ANGLE_2	Double	Angle of inclination of 2nd rotary axis of 2nd nutating head transformation	0. ~ 89. (45.0,45.0,...)	Degree	po
24680	TRAFO5_TOOL_VECTOR_2	Byte	Direction of orientation vector	0 ~ 2 (2,2,2,...)	-	po
24685	TRAFO5_ORIAX_ASSIGN_TAB_2[n]:0...2	Byte	ORI/channel axis assignment transformation 1	0 ~ 18 ({0,0,0}, {0,0,0} {0,...)	-	po
24700	TRAANG_ANGLE_1	Double	Angle between Cartesian axis and real (inclined) axis	- ~ - (0.0,0.0,...)	Degree	po
24710	TRAANG_BASE_TOOL_1[n]:0...2	Double	Vector of base tool for 1st TRAANG transformation	- ~ - ({0.0,0.0,0.0}, {0.0,...)	mm	po
24720	TRAANG_PARALLEL_VELO_RES_1	Double	Velocity margin of parallel axis for the 1st TRAANG transformation	0.0 ~ 1.0 (0.0,0.0,0.0,...)	Factor	po

24721	TRAANG_PARALLEL_ ACCEL_RES_1	Double	Acceleration margin of parallel axis for the 1st TRAANG transformation	0.0 ~ 1.0 (0.0,0.0,0.0,...)	Factor	po
24750	TRAANG_ANGLE_2	Double	Angle between Cartesian axis and real (inclined) axis	- ~ - (0.0,0.0,...)	Degree	po
24760	TRAANG_BASE_ TOOL_2[n]:0...2	Double	Vector of base tool for 2nd TRAANG transformation	- ~ - ({0.0,0.0,0.0}, {0.0,...)	mm	po
24770	TRAANG_PARALLEL_ VELO_2	Double	Velocity margin of parallel axis for the 2nd TRAANG transformation	0.0 ~ 1.0 (0.0,0.0,0.0,...)	Factor	po
24771	TRAANG_PARALLEL_ ACCEL_RES_2	Double	Acceleration margin of parallel axis for the 2nd TRAANG transformation	0.0 ~ 1.0 (0.0,0.0,0.0,...)	Factor	po
24800	TRACYL_ROT_AX_ OFFSET_1	Double	Offset of rotary axis for the 1st TRACYL transformation	- ~ - (0.0,0.0,...)	Degree	po
24810	TRACYL_ROT_SIGN_ IS_PLUS_1	Boolean	Sign of rotary axis for 1st TRACYL transformation	(1)	-	po
24820	TRACYL_BASE_TOOL_ 1[n]:0...2	Double	Vector of base tool for 1st TRACYL transformation	- ~ - ({0.0,0.0,0.0}, {0.0,...)	mm	po
24850	TRACYL_ROT_AX_ OFFSET_2	Double	Offset of rotary axis for the 2nd TRACYL transformation	- ~ - (0.0,0.0,...)	Degree	po
24860	TRACYL_ROT_SIGN_ IS_PLUS_2	Boolean	Sign of rotary axis for 2nd TRACYL transformation	(1)	-	po
24870	TRACYL_BASE_TOOL_ 2[n]:0...2	Double	Vector of base tool for 2nd TRACYL transformation	- ~ - ({0.0,0.0,0.0}, {0.0,...)	mm	po
24900	TRANSMIT_ROT_AX_ OFFSET_1	Double	Offset of rotary axis for the 1st TRANSMIT transformation	- ~ - (0.0,0.0,...)	Degree	po
24910	TRANSMIT_ROT_SIGN_ IS_PLUS_1	Boolean	Sign of rotary axis for 1st TRANSMIT transformation	(1)	-	po
24911	TRANSMIT_POLE_SIDE_ FIX_1	Byte	Restriction of working range in front of/behind the pole, 1. TRANSMIT	0 ~ 2 (0,0,0,...)	-	po
24920	TRANSMIT_BASE_ TOOL_1[n]:0...2	Double	Vector of base tool for 1st TRANSMIT transformation	- ~ - ({0.0,0.0,0.0}, {0.0,...)	mm	po
24950	TRANSMIT_ROT_AX_ OFFSET_2	Double	Offset of rotary axis for the 2nd TRANSMIT transformation	- ~ - (0.0,0.0,...)	Degree	po
24960	TRANSMIT_ROT_SIGN_ IS_PLUS_2	Boolean	Sign of rotary axis for 2nd TRANSMIT transformation	(1)	-	po
24961	TRANSMIT_POLE_ SIDE_FIX_2	Byte	Restriction of working range in front of/behind the pole, 2. TRANSMIT	0 ~ 2 (0,0,0,...)	-	po
24970	TRANSMIT_BASE_ TOOL_2[n]:0...2	Double	Vector of base tool for 2nd TRANSMIT transformation	- ~ - ({0.0,0.0,0.0}, {0.0,...)	mm	po
24995	TRACON_CHAIN_1 [N]:0...3	D word	Linking transformations	0 ~ 8 ({0,0,0,0}, (0,0,0,0), {0,...)	-	po
24996	TRACON_CHAIN_2 [N]:0...3	D word	Linking transformations	0 ~ 8 ({0,0,0,0}, (0,0,0,0), {0,...)	-	po

2.4.6 Punching and Nibbling

26000	PUNCHNIB_ASSIGN_ FASTIN	D word	Hardware assignment for input byte for stroke control	- ~ - (0,0,0,...)	HEX	po
26002	PUNCHNIB_ASSIGN_ FASTOUT	D word	Hardware assignment for output byte for stroke control	- ~ - (0,0,0,...)	HEX	po
26004	NIBBLE_PUNCH_ OUTMASK[N]:0...7	Byte	Screenform for fast output bits	- ~ -({1,0,0,0,0, 0,0,0}, {0,0,...)	HEX	po
26006	NIBBLE_PUNCH_ INMASK[N]:0...7	Byte	Screenform for fast input bits	- ~ -({1,0,0,0,0, 0,0,0}, {0,0,...)	HEX	po
26008	NIBBLE_PUNCH_ CODE[N]:0...7	D word	Definition of M functions	- ~ - ({1,23,22,25, 26,0,0,0}, {0,0,...)	HEX	po
26010	PUNCHNIB_AXIS_MASK	D word	Definition of punching and nibbling axes	- ~ - (7,0,0,...)	HEX	po
26012	PUNCHNIB_ACTIVATION	D word	Activation of punching and nibbling functions	- ~ - (0,0,0,...)	HEX	po
26014	PUNCH_PATH_ SPLITTING	D word	Activation of automatic path segmentation	- ~ - (0,0,0,...)	HEX	po
26016	PUNCH_PARTITION_ TYPE	D word	Behavior of individual axes with automatic path segmentation	- ~ - (1,0,0,...)	HEX	po
26018	NIBBLE_PRE_START_ TIME	Double	Delay time for nibbling/punching with G603	- ~ - (0.,0.,...)	sec	po
26020	NIBBLE_SIGNAL_CHECK	D word	Alarm chattering punching signal	- ~ - (0,0,0,...)	-	po
27800	TECHNOLOGY_MODE	Byte	Mode of technology in channel	0 ~ 255 (0,0,0,...)	-	cf
27900	REORG_LOG_LIMIT	Byte	Percentage of IPO buffer for enabling log file	- ~ - (1,1,1,...)	-	po

2.4.7 Channel-Specific Memory Settings

28000	MM_REORG_LOG_ FILE_MEM	D word	Memory space for REORG (DRAM)		1 ~ 500 (10,10,...)	kB	po
28010	MM_NUM_REORG_ LUD_MODULES	D word	Number of blocks for local user variables in REORG (DRAM)		0 ~ 100 (4,4,4,...)	-	po
28020	MM_NUM_LUD_NAMES_ TOTAL	D word	Number of local user variables		0.0 ~ plus (200,200,200,...)	-	po
28040	MM_LUD_VALUES_ MEM	D word	Memory space for local user variables (DRAM)	NC memory LUD	0.0 ~ plus (12,12,12,...)	kB	po
				LUD, NCU573	0.0 ~ plus (25,25,25,...)		
28050	MM_NUM_R_PARAM	D word	Number of channel-specific R parameters		0 ~ 10000 (100,100,100,...)	-	po
28060	MM_IPO_BUFFER_ SIZE	D word	Number of NC blocks in IPO buffer (DRAM)	NCU572, 573	2 ~ 300 (10,10,...)	-	po
				NCU571	2 ~ 15 (10,10,...)		
				810D	2 ~ 180 (10,10,...)		
				810D_2	2 ~ 300 (10,10,...)		

28070	MM_NUM_BLOCKS_IN_PREP	D word	Number of blocks for block preparation (DRAM)	NCU572, 573	20 ~ *** (37,37...)	-	po
				NCU571	20 ~ *** (28,28,...)		
				810D	20 ~ *** (28,28,...)		po
				810D_2	20 ~ *** (37,37,...)		
28080	MM_NUM_USER_FRAMES	D word	Number of settable frames (SRAM)		5 ~ MD_MAXNUM_CHIFRAMES (5,5,...)	-	po
28081	MM_NUM_BASE_FRAMES	D word	Number of base frames (SRAM)		0 ~ MD_MAXNUM_CHBFRAMES (1,1,...)	-	po
28085	MM_LINK_TOA_UNIT	D word	Assignment of a TO unit to a channel (SRAM)		1 ~ 10 (1,2,3,4,...)	-	po
28090	MM_NUM_CC_BLOCK_ELEMENTS	D word	Number of block elements for compile cycles (DRAM)		0 ~ 20 (0,0,0,...)	-	po
28100	MM_NUM_CC_BLOCK_USER_MEM	D word	Size of block memory for compile cycles (DRAM), in KB	Compile cycle	0 ~ 256 (0,0,0,...)	kB	po
				NCU570, 572, 573 compile cycle	0 ~ 256 (256,0,0,...)		
28105	MM_NUM_CC_HEAP_MEM	D word	Heap memory in kbytes for compile-cycle applications		0.0 ~ plus (0,0,0,...)	-	po
28150	MM_NUM_VDIVAR_ELEMENTS	D word	Number of elements for writing PLC variables		0.0 ~ plus (0,0,...)	-	po
28160	MM_NUM_LINKVAR_ELEMENTS	D word	NCU-link-variables		0.0 ~ plus (0,0,...)	-	po
28180	MM_MAX_TRACE_DATAPOINTS	D word	Length of the trace data buffer		0 ~ 500 (100,100,100,...)	-	po
28200	MM_NUM_PROTECT_AREA_CHAN	D word	Number of files for channel-specific protection zones		0 ~ 10 (0,0,0,...)	-	po
28210	MM_NUM_PROTECT_AREA_ACTIVE	D word	Number of simultaneously active protection zones in one channel		0 ~ 10 (0,0,0,...)	-	po
28250	MM_NUM_SYNC_ELEMENTS	D word	Number of elements for expressing the synchronized actions	840D, 810D, 810D_2	0 ~ 200 (159,159, 129,129,129,...)	-	po
				NCU571, 810D	0 ~ 200 (117,99, 99,99,99,99,...)		
28252	MM_NUM_FCTDEF_ELEMENTS	D word	Number of FCTDEF elements	840D, 810D, 810D_2	0 ~ 100 (3,3,3,...)	-	po
				NCU571, 810D	0 ~ 3 (3,3,3,...)		
28254	MM_NUM_AC_PARAM	D word	Number of parameters SAC_PARAN		0 ~ 10000 (50,50,50,...)	-	po
28256	MM_NUM_AC_MARKER	D word	Number of flags $AC_MARKER		0 ~ 10000 (8,8,...)	-	po
28258	MM_NUM_AC_TIMER	D word	Number of time variables $AC_TIMER		0 ~ 10000 (0,0,...)	-	po
28260	NUM_AC_FIFO	D word	Number of variables $AC_FIFO1		0 ~ 10 (0,0,0,...)	-	po
28262	START_AC_FIFO	D word	FIFO variables store from R parameter		0 ~ 10000 (0,0,...)	-	po

28264	LEN_AC_FIFO	D word	Length of the FIFO variables $AC_FIFO		0 ~ 10000 (0,0,...)	-	po
28266	MODE_AC_FIFO	Byte	Mode of FIFO processing		0 ~ *** (0,0,0,...)	-	po
28500	MM_PREP_TASK_ STACK_SIZE	D word	Stack size of preparation task (DRAM)	Always	4 ~ 40	kB	po
				NCU572, 573, 810D	4 ~ 40 (20,20,20,20,...)		
				NCU571	4 ~ 40 (32,20,20,20,...)		
28510	MM_IPO_TASK_ STACK_SIZE	D word	Stack size of IPO task (DRAM)	Always	4 ~ 40	kB	po
				NCU572, 573, 810D	4 ~ 40 (12,12,12,12,...)		
				NCU571	4 ~ 40 (8,12,12,12,...)		
28520	MM_MAX_AXISPOLY_ PER_BLOCK	D word	Maximal number of axial polynomials per block	NCU572, 573	1 ~ 5 (3,3,3,...)	-	po
				NCU571, 570, 810D	1 ~ 5 (1,1,1,...)		
29000	LOOKAH_NUM_ CHECKED_BLOCKS	D word	Option data		- ~ - (1,1,1,...)	-	po

2.5 AXIS-SPECIFIC MACHINE DATA

2.5.1 Configuration

Number	Name	Data type	Contents		Setting range (Default)	Unit	Active
30100	CTRLOUT_SEGMENT_NR[0]	Byte	Setpoint assignment: Drive type	Always		-	po
				NCU572, 573	0 ~ 1 (1)		
				NCU571	0 ~ 1 (1)		
				NCU570	0 ~ 2 (0)		
				810D	0 ~ 1 (1)		
30110	CTRLOUT_MODULE_NR[0]	Byte	Setpoint assignment: Drive number/module no.		1 ~ 31 (1)	-	po
30120	CTRLOUT_NR[0]	Byte	Setpoint assignment: Setpoint output on drive submodule/module		1 ~ 3 (1)	-	po
30130	CTRLOUT_TYPE[0]	Byte	Output type of setpoint		0 ~ 3 (0)	-	po
30132	IS_VIRTUAL_AX[0]	Boolean	Axis is a virtual axis		(0)	-	cf
30200	NUM_ENCS	Byte	Number of encoders		0 ~ 2 (1) (FM-NC: 1)	-	po
30210	ENC_SEGMENT_NR [n]:0_max_enc._1	Byte	Actual value assignment: Drive type	Always		-	po
				NCU572, 573	0 ~ 1 (1,1)		
				NCU571	0 ~ 1 (1,1)		
				NCU570	0 ~ 2 (0,0)		
				810D	0 ~ 1 (1,1)		
30220	ENC_MODULE_NR [n]:0_max_enc._1	Byte	Actual value assignment: Drive number/measuring circuit number		1 ~ 31 (1,1)	-	po
30230	ENC_INPUT_NR [n]:0_max_enc._1	Byte	Actual value assignment: Input to drive submodule/ measuring circuit board	Always	1 ~ 3 (1,2)	-	po
				810D	1 ~ 2 (1,1)		
30240	ENC_TYPE[n]:0_max_enc._1	Byte	Type of actual value sensing (actual position value)		0 ~ 4 (0,0)	-	po
30242	ENC_IS_INDEPENDENT [n]:0_max_enc._1	Boolean	Encoder is independent		(0)	-	cf
30250	ACT_POS_ABS[n]:0_max_ enc._1	Double	Absolute encoder position at power OFF time		- ~ - (0.0,0.0)	-	po
30300	IS_ROT_AX	Boolean	Rotary axis/spindle		(0)	-	po
30310	ROT_IS_MODULO	Boolean	Modulo conversion for rotary axis/ spindle		(0)	-	po
30320	DISPLAY_IS_MODULO	Boolean	Modulo 360 degrees display for rotary axes and spindle		(0)	-	po
30330	MODULO_RANGE	Double	Size of modulo range		1.0 ~ 360000000.0 (360.0)	deg	re
30350	SIMU_AX_VDI_OUTPUT	Boolean	Output of axis signals with simulation axes		(0)	-	po
30450	IS_CONCURRENT _POS_AX	Boolean	Competing positioning axis		(0)	-	re

30500	INDEX_AX_ASSIGN_ POS_TAB	Byte	Axis is indexing axis	0 ~ 3 (0)	-	re
30501	INDEX_AX_NUMERATOR	Double	Indexing axis equidistant positions numerator	0.0 ~ + (0.0)	mm, deg	re
30502	INDEX_AX_DENOMINATOR	D word	Indexing axis equidistant positions denominator	1 ~ *** (1)	-	re
30503	INDEX_AX_OFFSET	Double	Indexing axis with equidistant positions first index	- ~ - (0.0)	mm, deg	re
30505	HIRTH_IS_ACTIVE	Boolean	Axis is indexing axis with Hirth tooth system	(0)	-	re
30550	AXCONF_ASSIGN_ MASTER_CHAN	Byte	Initial setting of channel for change of axis	0 ~ 10 (0)	-	po
30552	AUTO_GET_TYPE	Byte	Automatic GET for get axis	0 ~ 2 (1)	-	po
30560	IS_LOCAL_LINK_AXIS	Boolean	Axis is a local link axis	(0)	-	po
30600	FIX_POINT_POS [n]:0_max_fixed_ points_per_axis_1	Double	Fixed-value positions of axis with G75	- ~ - (0.0,0.0)	mm, deg	po

2.5.2 Encoder Matching

31000	ENC_IS_LINEAR [n]:0_max_enc._1	Boolean	Direct measuring system (linear scale)	(0)	-	po
31010	ENC_GRID_POINT _DIST[n]:0_max_enc._1	Double	Division period for linear scales	0.0 ~ + (0.01,0.01)	mm	po
31020	ENC_RESOL[n]:0_max_ enc._1	D word	Encoder lines per revolution	0.0 ~ + (2048,2048)	-	po
31030	LEADSCREW_PITCH	Double	Pitch of lead screw	0.0 ~ + (10.0)	mm	po
31040	ENC_IS_DIRECT[n]:0_ max_enc._1	Boolean	Encoder mounted directly on the machine	(0)	-	po
31050	DRIVE_AX_RATIO_ DENOM[n]:0...5	D word	Denominator load gearbox	1 ~ 2147000000 (1,1,1,1,1,1)	-	po
31060	DRIVE_AX_RATIO_ NUMERA[n]:0...5	D word	Numerator load gearbox	1 ~ 2147000000 (1,1,1,1,1,1)	-	po
31070	DRIVE_ENC_RATIO_ DENOM[n]:0_max_enc._1	D word	Denominator measuring gearbox	1 ~ 2147000000 (1,1)	-	po
31080	DRIVE_ENC_RATIO_ NUMERA[n]:0_max_enc._1	D word	Numerator measuring gearbox	1 ~ 2147000000 (1,1)	-	po
31090	JOG_INCR_WEIGHT [n]:0...1	Double	Evaluation of an increment with INC/handwheel	- ~ - (0.001,0.00254)	mm, deg	re
31100	BERO_CYCLE[n]:0_ max_enc._1	D word	Steps for monitoring rotation	10 ~ 10000000 (2000,2000)	-	po

31110	BERO_EDGE_TOL [n]:0_max_enc._1	D word	Step tolerance for monitoring rotation	Stepper motor	10 ~ 10000000 (50,50,)	-	po
				Square wave encoder NCU570_2	10 ~ 10000000 (1)		
31120	BERO_EDGE[n]:0_max_enc._1	Boolean	BERO evaluation edge	Stepper motor	(0)	-	po
				Stepper motor, NCU570_2	(1)		
31122	BERO_DELAY_TIME_PLUS[n]:0_max_enc._1	Double	BERO delay time plus		0.0 ~ + (0.000110, 0.000110)	sec	cf
31123	BERO_DELAY_TIME_MINUS[n]:0_max_enc._1	Double	BERO delay time minus		0.0 ~ + (0.000078, 0.000078)	sec	cf
31200	SCALING_FACTOR_G70_G71	Double	Factor for converting values while G70/G71 is active		0.0 ~ + (25.4)	-	po
31350	FREQ_STEP_LIMIT[0]	Double	Stepping rate at maximum velocity		100.0 ~ 4000000.0 (250000.0)	Hz	po
31400	STEP_RESOL[0]	D word	Number of steps per stepper motor revolution		0.0 ~ + (1000)	-	po
31500	AXIS_NUMBER_FOR_MONITORING[0]	D word	Setpoint of this axis output for service purposes		0 ~ 31 (0)	-	po
31510	OFFSETVALUE_FOR_MONITORING[0]	Double	Offset voltage for service setpoint		-10.0 ~ 10.0 (0.0)	V	cf
31520	GAIN_FOR_MONITORING[0]	Double	Gain for service setpoint		-100.0 ~ 100.0 (1.0)	-	cf

2.5.3 Closed-Loop Control

32000	MAX_AX_VELO	Double	Maximum axis velocity		0.0 ~ + (10000.)	mm/min, rev/min	cf
32010	JOG_VELO_RAPID	Double	Rapid traverse in jog mode		0.0 ~ + (10000.)	mm/min, rev/min	re
32020	JOG_VELO	Double	Jog axis velocity		0.0 ~ + (2000.)	mm/min, rev/min	re
32040	JOG_REV_VELO_RAPID	Double	Revolutional feedrate in JOG with rapid traverse override		0.0 ~ + (2.5)	mm/rev	re
32050	JOG_REV_VELO	Double	Revolutional feedrate in JOG		0.0 ~ + (0.5)	mm/rev	re
32060	POS_AX_VELO	Double	Initial setting for positioning axis velocity		0.0 ~ + (10000.)	mm/min, rev/min	re
32070	CORR_VELO	Double	Axis velocity for handwheel override, ext. ZO, cont. dressing, distance control		0.0 ~ + (50.0)	%	re
32074	FRAME_OR_CORRPOS_NOTALLOWED	D word	Fixed feedrates for rotary axes		0 ~ 0x3FF (0)	-	po
32080	HANDWH_MAX_INCR_SIZE	Double	Limitation of selected increment		0.0 ~ + (0.0)	mm, deg	re
32082	HANDWH_MAX_INCR_VELO_SIZE	Double	Limitation of selected increment for velocity overlay		0.0 ~ + (500.0)	mm/min, rev/min	re
32084	HANDWH_STOP_COND	D word	Control of VDI signals with respect to handwheel		0 ~ 0x1FF (0xFF)	-	re
32090	HANDWH_VELO_OVERLAY_FACTOR	Double	Ratio of JOG velocity to handwheel velocity (DRF)		0.0 ~ + (0.5)	-	re
32100	AX_MOTION_DIR	D word	Traversing direction (not control direction)		-1 ~ 1 (1)	-	po
32110	ENC_FEEDBACK_POL[n]:0_max_enc._1	D word	Sign actual value (control direction)		-1 ~ 1 (1,1)	-	po
32200	POSCTRL_GAIN[n]:0...5	Double	Servo gain factor		0 ~ 2 (1)	1000/min	cf
32250	RATED_OUTVAL[0]	Double	Rated output voltage		0.0 ~ + (80.0)	%	cf
32260	RATED_VELO[0]	Double	Rated motor speed	Always	0.0 ~ + (300)	rev/min	cf
				NCU572, 573	0.0 ~ + (100)		
32300	MAX_AX_ACCEL	Double	Axis acceleration		0 ~ *** (1)	mm/s^2, rev/s^2	cf
32310	MAX_ACCEL_OVL_FACTOR	Double	Overload factor for axial velocity steps		0.0 ~ + (1.2)	Factor	cf
32400	AX_JERK_ENABLE	Boolean	Axial jerk limitation		(0)	-	cf
32402	AX_JERK_MODE	Byte	Axial jerk limitation filter type		1 ~ 2 (1)	-	po
32410	AX_JERK_TIME	Double	Time constant for axial jerk filter		0.0 ~ + (0.001)	sec	cf
32420	JOG_AND_POS_JERK_ENABLE	Boolean	Default setting of axis jerk limitation		(0)	-	re

32430	JOG_AND_POS_MAX_ JERK	Double	Axial jerk		0.0 ~ + (1000)	m/s^3, deg/s^3	re
32431	MAX_AX_JERK	Double	Maximum axial jerk for path movement		0.0 ~ + (1.e9)	m/s^3, deg/s^3	cf
32432	PATH_TRANS_JERK _LIM	Double	Maximum axial jerk of a geo axis at block limit		0.0 ~ + (1.e9)	m/s^3, deg/s^3	cf
32450	BACKLASH[n]:0_max_ enc._1	Double	Backlash		- ~ - (0.0,0.0)	mm, deg	cf
32452	BACKLASH_FACTOR [n]:0...5	Double	Backlash evaluation factor		0.01 ~ 100.0 (1.0,1.0,1.0,1.0,1.0,1.0,)	-	cf
32460	TORQUE_OFFSET[0] (0.0)	Double	Additional torque for electronic weight compensation		-100.0 ~ 100.0 (0.0)	%	cf
32490	FRICT_COMP_MODE[0]	Byte	Type of friction compensation	Always	0 ~ 2 (1)	-	po
				810D	0 ~ 1 (1)		
32500	FRICT_COMP_ENABLE	Boolean	Friction compensation active		(0)	-	cf
32510	FRICT_COMP_ADAPT_ ENABLE[0]	Boolean	Adaptation friction compensation active		(0)	-	cf
32520	FRICT_COMP_CONST_ MAX[0]	Double	Maximum friction compensation value		0.0 ~ + (0.0)	mm/min, rev/min	cf
32530	FRICT_COMP_CONST_ MIN[0]	Double	Minimum friction compensation value		0.0 ~ + (0.0)	mm/min, rev/min	cf
32540	FRICT_COMP_TIME[0]	Double	Friction compensation time constant		0.0 ~ + (0.015)	sec	cf
32550	FRICT_COMP_ ACCEL1[0]	Double	Adaptation acceleration value 1		0.0 ~ + (0.0)	mm/s^2, rev/s^2	cf
32560	FRICT_COMP_ ACCEL2[0]	Double	Adaptation acceleration value 2		0.0 ~ + (0.0)	mm/s^2, rev/s^2	cf
32570	FRICT_COMP_ ACCEL3[0]	Double	Adaptation acceleration value 3		0.0 ~ + (0.0)	mm/s^2, rev/s^2	cf
32580	FRICT_COMP_INC_ FACTOR[0]	Double	Weighting factor of friction compensation value with short traversing movements		0 ~ 100.0 (0.0)	%	cf
32610	VELO_FFW_WEIGHT [n]:0...5	Double	Feedforward factor for speed feedforward control		0.0 ~ + (1.0,1.0, 1.0,1.0,1.0,1.0)	Factor	cf
32620	FFW_MODE	Byte	Feedforward control type	Always	0 ~ 4 (3)	-	re
				810D	0 ~ 3 (3)		
32630	FFW_ACTIVATION_ MODE	Byte	Activate feedforward control from program		- ~ - (1)	-	re
32640	STIFFNESS_CONTROL_ ENABLE[0]	Boolean	Dynamic stiffness control		(0)	-	cf
32650	AX_INERTIA	Double	Moment of inertia for torque feedforward control		0.0 ~ + (0.0)	kgm^2	cf
32652	AX_MASS	Double	Axis mass for torque feedforward control		0.0 ~ + (0.0)	kg	cf

32700	ENC_COMP_ENABLE [n]:0_max_enc._1	Boolean	Interpolatory compensation		(0)	-	cf
32710	CEC_ENABLE	Boolean	Enable of sag compensation		(0)	-	cf
32711	CEC_SCALING_ SYSTEM_METRIC	Boolean	Measuring system of sag compensation		(1)	-	cf
32720	CEC_MAX_SUM	Double	Maximum compensation value for sag compensation		0 ~ 10.0 (1.0)	mm, deg	cf
32730	CEC_MAX_VELO	Double	Maximum change value with sag compensation with ref. too MD 32000		0 ~ 100.0 (10.0)	%	cf
32750	TEMP_COMP_TYPE	Byte	Temperature compensation type		0 ~ 3 (0)	HEX	po
32760	COMP_ADD_VELO_ FACTOR	Double	Excessive velocity due to compensation		0. ~ 0.10 (0.01)	Factor	po
32800	EQUIV_CURRCTRL_ TIME[n]:0...5	Double	Equivalent time constant current control loop for feedforward control		0.0 ~ + (0.0005, 0.0005, 0.0005, 0.0005,...)	sec	cf
32810	EQUIV_SPEEDCTRL_ TIME[n]:0...5	Double	Equivalent time constant speed control loop for feedforward control	Always	0.0 ~ +	sec	cf
				NCU570_2	0.0 ~ + (0.006,...)		
				NCU571	0.0 ~ + (0.006,...)		
				NCU572	0.0 ~ + (0.004,...)		
				NCU573	0.0 ~ + (0.008,...)		
				810D	0.0 ~ + (0.0025,...)		
				810D_2	0.0 ~ + (0.0025,...)		
32900	DYN_MATCH_ENABLE	Boolean	Dynamic response adaptation		(0)	-	cf
32910	DYN_MATCH_TIME [n]:0...5	Double	Time constant of dynamic response adaptation		0.0 ~ + (0.0,0.0, 0.0,0.0,0.0,0.0)	sec	cf
32920	AC_FILTER_TIME	Double	Smoothing filter time constant for adaptive control		0.0 ~ + (0.0)	sec	po
32950	POSCTRL_DAMPING	Double	Damping of servo loop		0.0 ~ + (0.0)	Factor	cf
33000	FIPO_TYPE	Byte	Fine interpolator type (1: differential FIPO, 2: cubic FIPO)		1 ~ 2 (2)	-	po
33050	LUBRICATION_DIST	Double	Traversing path for lubrication from PLC		0. ~ + (100000000)	mm, deg	cf
33100	COMPRESS_POS_ TOL	Double	Maximum deviation during compression	Function: Polynomial	0.0 ~ + (0.1)	mm, deg	cf
				Function: NCU570 polynomial	0.0 ~ + (0.1)		

2.5.4 Reference Point Approach

34000	REFP_CAM_IS_ACTIVE	Boolean	Axis with reference point cam	(1)	-	re
34010	REFP_CAM_DIR_IS_ MINUS	Boolean	Approach reference point in minus direction	(0)	-	re
34020	REFP_VELO_SEARCH_ CAM	Double	Reference point approach velocity	0.0 ~ + (5000.0)	mm/min, rev/min	re
34030	REFP_MAX_CAM_DIST	Double	Maximum distance to reference cam	0.0 ~ + (10000.0)	mm, deg	re
34040	REFP_VELO_SEARCH_ MARKER[n]:0_max_enc._1	Double	Creep velocity	0.0 ~ + (300.0,300.0)	mm/min, rev/min	re
34050	REFP_SEARCH_ MARKER_REVERSE [n]:0_max_enc._1	Boolean	Direction reversal to reference cams	(0)	-	re
34060	REFP_MAX_MARKER_ DIST[n]:0_max_enc._1	Double	Maximum distance to reference mark. Max. distance to 2 reference marks	0.0 ~ + (20.0,20.0)	mm, deg	re
34070	REFP_VELO_POS	Double	Reference point positioning velocity	0.0 ~ + (10000.0)	mm/min, rev/min	re
34080	REFP_MOVE_DIST [n]:0_max_enc._1	Double	Reference point distance/target point for distance-coded system	- ~ - (-2.0,-2.0)	mm, deg	re
34090	REFP_MOVE_DIST_ CORR[n]:0_max_enc._1	Double	Reference point offset/absolute distance-coded offset	- ~ - (0.0,0.0)	mm, deg	re
34092	REFP_CAM_SHIFT [n]:0_max_enc._1	Double	Electric cam offset of incremental measuring systems with equidistant zero marks	0.0 ~ + (0.0,0.0)	mm, deg	re
34100	REFP_SET_POS[N]:0...3	Double	Reference point value/irrelevant for distance-coded system	- ~ - (0.,...)	mm, deg	re
34102	REFP_SYNC_ENCS	Byte	Calibration of measuring systems	0 ~ 1 (0)	-	re
34110	REFP_CYCLE_NR	D word	Sequence of axes in channel-specific referencing	-1 ~ 31 (1)	-	re
34200	ENC_REFP_MODE [n]:0_max_enc._1	Byte	Referencing mode	0 ~ 7 (1,1)	-	po
34210	ENC_REFP_STATE [n]:0_max_enc._1	Byte	Status absolute encoder	0 ~ 2 (0,0)	-	im
34220	ENC_ABS_TURNS_ MODULO[n]:0_max_enc._1	D word	Absolute value encoder range for rotary encoders	1 ~ 4096 (4096,4096)	-	po
34300	ENC_REFP_MARKER_ DIST[n]:0_max_enc._1	Double	Reference mark distance for distance-coded scales	- ~ - (10.0,10.0)	mm, deg	po
34310	ENC_MARKER_INC [n]:0_max_enc._1	Double	Interval between reference marks for distance-coded scales	0.0 ~ + (0.02,0.02)	mm, deg	re
34320	ENC_INVERS[n]:0_max_ enc._1	Boolean	Linear measurement system in an opposite direction	(0)	-	re
34330	REFP_STOP_AT_ABS_ MARKER[n]:0_max_enc._1	Boolean	Distance-coded linear measurement system without target point	(1)	-	re

2.5.5 Spindle

35000	SPIND_ASSIGN_TO_ MACHAX	Byte	Assignment of spindle to machine axis	0 ~ 15 (0)	-	po
35010	GEAR_STEP_CHANGE_ ENABLE	Boolean	Gear change possible. Spindle has several gear stages	(0)	-	po
35020	SPIND_DEFAULT_MODE	Byte	Initial spindle setting	0 ~ 3 (0)	-	re
35030	SPIND_DEFAULT_ACT_ MASK	Byte	Time at which initial spindle setting is effective	0 ~ 0x03 (0x00)	HEX	re
35032	SPIND_FUNC_RESET_ MODE	D word	Reset response of single spindle functions	0 ~ 0x01 (0x00)	-	re
35040	SPIND_ACTIVE_AFTER_ RESET	Boolean	Own spindle RESET	(0)	-	po
35100	SPIND_VELO_LIMIT	Double	Maximum spindle speed	0.0 ~ + (10000)	rev/min	cf
35110	GEAR_STEP_MAX_VELO [n]:0_max_Gear.1	Double	Maximum speed for gear change	0.0 ~ + (500)	rev/min	cf
35120	GEAR_STEP_MIN_VELO [n]:0_max_Gear.1	Double	Minimum speed for gear change	0.0 ~ + (50)	rev/min	cf
35130	GEAR_STEP_MAX_ VELO_LIMIT [n]:0_max_Gear.1	Double	Maximum speed of gear stage	0.0 ~ + (500)	rev/min	cf
35140	GEAR_STEP_MIN_ VELO_LIMIT [n]:0_max_Gear.1	Double	Minimum speed of gear stage	0.0 ~ + (5)	rev/min	cf
35150	SPIND_DES_VELO_TOL	Double	Spindle speed tolerance	0.0 ~ 1.0 (0.1)	Factor	re
35160	SPIND_EXTERN_VELO_ LIMIT	Double	Spindle speed limitation from PLC	0.0 ~ + (1000)	rev/min	cf
35200	GEAR_STEP_ SPEEDCTRL_ACCEL [n]:0_max_Gear.1	Double	Acceleration in speed control mode	2 ~ *** (30)	rev/s^2	cf
35210	GEAR_STEP_POSCTRL_ ACCEL[n]:0_max_Gear.1	Double	Acceleration in position control mode	2 ~ *** (30)	rev/s^2	cf
35220	ACCEL_REDUCTION_ SPEED_POINT	Double	Speed for reduced acceleration	0.0 ~ 1.0 (1.0)	Factor	re
35230	ACCEL_REDUCTION_ FACTOR	Double	Reduced acceleration	0.0 ~ 0.95 (0.0)	Factor	re
35240	ACCEL_TYPE_DRIVE	Boolean	Type of acceleration	(0)	-	re
35242	ACCEL_REDUCTION_ TYPE	Byte	Type of acceleration reduction	0 ~ 2 (1)	-	re
35300	SPIND_POSCTRL_VELO	Double	Position control switch-on speed	0.0 ~ + (500)	rev/min	cf
35350	SPIND_POSITIONING_ DIR	Byte	Direction of rotation when positioning	3 ~ 4 (3)	-	re
35400	SPIND_OSCILL_DES_ VELO	Double	Oscillation speed	0.0 ~ + (500)	rev/min	cf

35410	SPIND_OSCILL_ACCEL	Double	Acceleration during oscillation	2 ~ *** (16)	rev/s^2	cf
35430	SPIND_OSCILL_START_ DIR	Byte	Starting direction during oscillation	0 ~ 4 (0)	-	re
35440	SPIND_OSCILL_TIME_ CW	Double	Oscillation time for M3 direction	0.0 ~ + (1.0)	sec	cf
35450	SPIND_OSCILL_TIME_ CCW	Double	Oscillation time for M4 direction	0.0 ~ + (0.5)	sec	cf
35500	SPIND_ON_SPEED_AT_ IPO_START	Byte	Feedrate enable for spindle in the set range	0 ~ 2 (1)	-	re
35510	SPIND_STOPPED_AT_ IPO_START	Boolean	Feedrate enable for spindle stopped	(0)	-	re
35590	PARAMSET_CHANGE_ ENABLE	Byte	Parameter set can be changed	0 ~ 2 (0)	-	po

2.5.6 Monitoring Functions

36000	STOP_LIMIT_COARSE	Double	Exact stop coarse	0.0 ~ + (0.04)	mm, deg	cf
36010	STOP_LIMIT_FINE	Double	Exact stop fine	0.0 ~ + (0.01)	mm, deg	cf
36012	STOP_LIMIT_FACTOR [n]:0...5	Double	Factor for exact stop coarse/fine and standstill	0.001 ~ 1000.0 (1.0,1.0,1.0,1.0,1.0,1.0)	-	cf
36020	POSITIONING_TIME	Double	Delay time exact stop fine	0.0 ~ + (1.0)	sec	cf
36030	STANDSTILL_POS_TOL	Double	Standstill tolerance	0.0 ~ + (0.2)	mm, deg	cf
36040	STANDSTILL_DELAY_ TIME	Double	Delay zero speed control	0.0 ~ + (0.4)	sec	cf
36050	CLAMP_POS_TOL	Double	Clamping tolerance	0.0 ~ + (0.5)	mm, deg	cf
36060	STANDSTILL_VELO_ TOL	Double	Maximum velocity/speed "axis/ spindle stopped"	0.0 ~ + (5.0)	mm/min, rev/min	cf
36100	POS_LIMIT_MINUS	Double	1st software limit switch minus	- ~ - (-100000000)	mm, deg	re
36110	POS_LIMIT_PLUS	Double	1st software limit switch plus	- ~ - (100000000)	mm, deg	re
36120	POS_LIMIT_MINUS2	Double	2nd software limit switch minus	- ~ - (-100000000)	mm, deg	re
36130	POS_LIMIT_PLUS2	Double	2nd software limit switch plus	- ~ - (100000000)	mm, deg	re
36200	AX_VELO_LIMIT [n]:0...5	Double	Threshold value for velocity monitoring	0.0 ~ + (11500., 11500.,11500.,11500.,...)	mm/min, rev/min	cf
36210	CTRLOUT_LIMIT[0]	Double	Maximum speed setpoint	0 ~ 200 (110.0)	%	cf
36220	CTRLOUT_LIMIT_ TIME[0]	Double	Delay time for speed setpoint monitoring	0.0 ~ + (0.0)	sec	cf
36300	ENC_FREQ_LIMIT [n]:0_max_enc._1	Double	Encoder limit frequency	0.0 ~ + (300000)	Hz	po
36302	ENC_FREQ_LIMIT_LOW [n]:0_max_enc._1	Double	Encoder limit frequency at which encoder is switched on again	0 ~ 100 (99.9,99.9)	%	cf
36310	ENC_ZERO_MONITORING [n]:0_max_enc._1	D word	Zero mark monitoring	0.0 ~ + (0,0)	-	cf
36400	CONTOUR_TOL	Double	Tolerance band for contour monitoring	0.0 ~ + (1.0)	mm, deg	cf

36500	ENC_CHANGE_TOL	Double	Maximum tolerance for position actual value switchover		0.0 ~ + (0.1)	mm, deg	cf
36510	ENC_DIFF_TOL	Double	Tolerance of measuring system synchronization		0.0 ~ + (0.0)	mm, deg	cf
36520	DES_VELO_LIMIT	Double	Threshold for setpoint velocity monitoring		0.0 ~ + (125.0)	%	cf
36600	BRAKE_MODE_CHOICE	Byte	Deceleration response on hardware limit switch		0 ~ 1 (1)	-	po
36610	AX_EMERGENCY_ STOP_TIME	Double	Duration of the deceleration ramp for error states		0.0 ~ + (0.05)	sec	cf
36620	SERVO_DISABLE_ DELAY_TIME	Double	Cutout delay servo enable		0.0 ~ + (0.1)	sec	cf
36690	AXIS_DIAGNOSIS	D word	Internal data for test purposes		- ~ - (0)	-	po
36700	DRIFT_ENABLE	Boolean	Automatic drift compensation		(0)	-	cf
36710	DRIFT_LIMIT[0]	Double	Drift limit value for automatic drift compensation	Always	0.0 ~ + (0.0)	%	cf
				NCU572, 573	0.0 ~ + (1.0)		
				NCU571	0.0 ~ + (1.0)		
				810D	0.0 ~ + (1.0)		
36720	DRIFT_VALUE[0]	Double	Basic drift value	Always	(0.0)	%	cf
				NCU572, 573	-5.0 ~ 5.0 (0.0)		
				NCU571	-5.0 ~ 5.0 (0.0)		
				810D	-5.0 ~ 5.0 (0.0)		
36730	DRIVE_SIGNAL_ TRACKING	Byte	Acquisition of additional drive actual values		0 ~ 4 (0)	-	po
36750	AA_OFF_MODE	Byte	Effect of value assignment for axial overlay in synchronous actions		0 ~ 1 (0)	-	po

2.5.7 Safety Integrated

36901	SAFE_FUNCTION_ ENABLE	D word	Enable safety functions	Function: Safety integrated	(0)	HEX	po
				Function: Safety integrated SW1	0 ~ 0xFF03 (0)		
				Function: Safety integrated SW2	0 ~ 0xFF03 (0)		
36902	SAFE_IS_ROT_AX	Boolean	Rotary axis		(0)	-	po
36905	SAFE_MODULO_RANGE	Double	Range of SI actual value (rev.)		0.0 ~ 737280.0 (0.0)	deg	po
36910	SAFE_ENC_SEGMENT_ NR	Byte	Actual value assignment type of drive		0 ~ 1 (1)	-	po
36911	SAFE_ENC_MODULE_ NR	Byte	Actual value assignment: drive number/measurement circuit number		1 ~ 31 (1)	-	po
36912	SAFE_ENC_INPUT_NR	Byte	Actual value assignment: input on drive module/measurement circuit board		1 ~ 2 (1)	-	po
36915	SAFE_ENC_TYPE	Byte	Encoder type		0 ~ 4 (0)	-	po
36916	SAFE_ENC_IS_LINEAR	Boolean	Linear scale		(0)	-	po
36917	SAFE_ENC_GRID_ POINT_DIST	Double	Scale division for linear scale		0.00001 ~ 8 (0.01)	mm	po
36918	SAFE_ENC_RESOL	D word	Encoder marking per revolution		1 ~ 100000 (2048)	-	po
36920	SAFE_ENC_GEAR_PITCH	Double	Lead screw pitch		0.1 ~ 10000. (10.)	mm	po
36921	SAFE_ENC_GEAR_ DENOM[n]:0...7	D word	Denominator of gearbox encoder/ load		1 ~ 2147000000 (1,1,1,1,1,1,1,1)	-	po
36922	SAFE_ENC_GEAR_ NUMERA[n]:0...7	D word	Numerator of gearbox encoder/ load		1 ~ 2147000000 (1,1,1,1,1,1,1,1)	-	po
36925	SAFE_ENC_POLARITY	D word	Direction reversal of actual value		-1 ~ 1 (1)	-	po
36930	SAFE_STANDSTILL_TOL	Double	Standstill tolerance		0. ~ 100. (1.)	mm, deg	po
36931	SAFE_VELO_LIMIT [n]:0...3	Double	Limit value for safe velocity		0.0 ~ + (2000.,...)	mm/min, rev/min	po
36932	SAFE_VELO_OVR_ FACTOR[n]:0...15	D word	Safe velocity override value		1 ~ 100 (100,100, 100,100,100,100,100,...)	%	po
36933	SAFE_DES_VELO_LIMIT	D word	SG setpoint speed limiting		0 ~ 100 (0)	%	po
36934	SAFE_POS_LIMIT_PLUS [n]:0...1	Double	Upper limit of safe end position		-2147000 ~ 2147000 (100000., 100000.)	mm, deg	po
36935	SAFE_POS_LIMIT_MINUS [n]:0...1	Double	Lower limit of safe end position		-2147000 ~ 2147000 (-100000., -100000.)	mm, deg	po

36936	SAFE_CAM_POS_ PLUS[n]:0...3	Double	Plus cam position for safe cams		-2147000 ~ 2147000 (10.,10.,10.,10)	mm, deg	po
36937	SAFE_CAM_POS_MINUS [0...3]	Double	Minus cam position for safe cams		-2147000 ~ 2147000 (-10.,-10.,-10.,-10)	mm, deg	po
36940	SAFE_CAM_TOL	Double	Tolerance for safe cams		0.001 ~ 10 (0.1)	mm, deg	po
36942	SAFE_POS_TOL	Double	Tolerance actual value cross-check		0.001 ~ 360 (0.1)	mm, deg	po
36944	SAFE_REFP_POS_TOL	Double	Tolerance actual value check (referencing)		0 ~ 36 (0.01)	mm, deg	po
36946	SAFE_VELO_X	Double	Speed limit n_x		0. ~ 1000. (20.)	mm/min, rev/min	po
36948	SAFE_STOP_VELO_ TOL	Double	Velocity tolerance for safe braking ramp		0. ~ 20000. (300.)	mm/min, rev/min	po
36950	SAFE_MODE_SWITCH_ TIME	Double	Tolerance time for SGE swuitchover		0 ~ 10. (0.5)	sec	po
36951	SAFE_VELO_SWITCH_ DELAY	Double	Delay time for velocity changeover		0 ~ 10 (0.1)	sec	po
36952	SAFE_STOP_SWITCH_ TIME_C	Double	Transition time STOP C to safe standstill		0 ~ 10 (0.1)	sec	po
36953	SAFE_STOP_SWITCH_ TIME_D	Double	Transition time STOP D to safe standstill		0 ~ 10 (0.1)	sec	po
36954	SAFE_STOP_SWITCH_ TIME_E	Double	Transition time STOP D to safe standstill (in preparation)		0 ~ 10 (0.1)	sec	po
36956	SAFE_PULSE_DISABLE_ DELAY	Double	Delay time for pulse suppression		0 ~ 10 (0.1)	sec	po
36957	SAFE_PULSE_DIS_ CHECK_TIME	Double	Time for checking pulse suppression		0 ~ 10 (0.1)	sec	po
36960	SAFE_STANDSTILL_ VELO_TOL	Double	Creep speed for pulse suppression		0.0 ~ 1000. (0.0)	mm/min, rev/min	po
36961	SAFE_VELO_STOP_ MODE	Byte	Stop reaction for safe velocity	Function: Safety integrated		-	po
				Function: Safety integrated SW1	2 ~ 3 (2)		
				Function: Safety integrated SW2	0 ~ 5 (5)		
36962	SAFE_POS_STOP_MODE	Byte	Stop reaction for safe end position		2 ~ 3 (2)	-	po
36963	SAFE_VELO_STOP_ REACTION[n]:0...3	Byte	Stop reaction for safe velocity		0 ~ 3 (2,2,2,2)	-	po
36970	SAFE_SVSS_DISABLE_ INPUT	D word	Input assignment SBH/SG deselection		- ~ - (0)	HEX	po

36971	SAFE_SS_DISABLE_ INPUT	D word	Input assignment SBH deselection	- ~ - (0)	HEX	po
36972	SAFE_VELO_SELECT _INPUT[0...1]	D word	Input assignment SBH selection	- ~ - (0,0)	HEX	po
36973	SAFE_POS_SELECT_ INPUT	D word	Input assignment SE selection	- ~ - (0)	HEX	po
36974	SAFE_GEAR_SELECT _INPUT[0...2]	D word	Input assignment speed ratio selection	- ~ - (0,0,0)	HEX	po
36975	SAFE_STOP_REQUEST_ INPUT	D word	Input assignment test stop selection	- ~ - (0)	HEX	po
36976	SAFE_PULSE_STATUS_ INPUT	D word	Input assignment status pulses suppressed	- ~ - (0)	HEX	po
36977	SAFE_EXT_STOP_INPUT [0...2]	D word	Input assignment for external stop request	- ~ - (0,0,0)	-	po
36978	SAFE_OVR_INPUT[0...3]	D word	Input assignment for SG override	- ~ - (0,0,0,0)	-	po
36980	SAFE_SVSS_STATUS _OUTPUT	D word	Output assignment SBH/SG active	- ~ - (0)	HEX	po
36981	SAFE_SS_STATUS_ OUTPUT_OUTPUT	D word	Output assignment SBH active	- ~ - (0)	-	po
36982	SAFE_VELO_STATUS_ OUTPUT[0...1]	D word	Output assignment SG active	- ~ - (0,0)	-	po
36985	SAFE_VELO_X_STATUS_ OUTPUT	D word	Output assignment n<n_x	- ~ - (0)	-	po
36986	SAFE_PULSE_ENABLE_ OUTPUT	D word	Output assignment pulse suppression	- ~ - (0)	HEX	po
36987	SAFE_REFP_STATUS_ OUTPUT	D word	Output assignment axis safety referenced	- ~ - (0)	HEX	po
36988	SAFE_CAM_PLUS_ OUTPUT[0...3]	D word	Output assignment SN1+ ~ SN4+	- ~ - (0,0,0,0)	HEX	po
36989	SAFE_CAM_MINUS_ OUTPUT[0...3]	D word	Output assignment SN1- ~ SN4-	- ~ - (0,0,0,0)	HEX	po
36990	SAFE_ACT_STOP_ OUTPUT[0...4]	D word	Output assignment current stop	- ~ - (0,0,0,0)	-	po
36995	SAFE_STANDSTILL_POS	D word	Standstill position	- ~ - (0)	-	po
36997	SAFE_ACKN	D word	User acknowledge	- ~ - (0)	HEX	po
36998	SAFE_ACT_CHECKSUM	D word	Actual checksum	- ~ - (0)	HEX	po
36999	SAFE_DES_CHECKSUM	D word	Desired (expected) checksum	- ~ - (0)	HEX	po

2.5.8 Travel to Fixed Stop

37000	FIXED_STOP_MODE	Byte	Mode travel to fixed stop	0 ~ 1 (0)	-	po
37010	FIXED_STOP_TORQUE_DEF	Double	Default fixed stop clamping torque	0.0 ~ 100.0 (5.0)	%	po
37020	FIXED_STOP_WINDOW_DEF	Double	Default fixed-stop monitoring window	0.0 ~ + (1.0)	mm, deg	po
37030	FIXED_STOP_THRESHOLD	Double	Threshold for fixed stop detection	0.0 ~ + (2.0)	mm, deg	cf
37040	FIXED_STOP_BY_SENSOR	Byte	Fixed stop detection by sensor	0 ~ 2 (0)	-	po
37050	FIXED_STOP_ALARM_MASK	Byte	Enable of the fixed stop alarms	0 ~ 7 (1)	-	cf
37060	FIXED_STOP_ACKN_MASK	Byte	PLC acknowledgements observed for travel to fixed stop	0 ~ 3 (0)	-	po
37070	FIXED_STOP_ANA_TORQUE	Double	Torque limit when approaching the fixed stop for analog drives	0.0 ~ 100.0 (5.0)	%	po
37100	GANTRY_AXIS_TYPE	Byte	Gantry axis definition	0 ~ 33 (0)	-	po
37110	GANTRY_POS_TOL_WARNING	Double	Gantry warning limit	(0.0)	mm/deg	re
37120	GANTRY_POS_TOL_ERROR	Double	Gantry trip limit	(0.0)	mm, deg	po
37130	GANTRY_POS_TOL_REF	Double	Gantry trip limit during referencing	(0.0)	mm, deg	po
37140	GANTRY_BREAK_UP	Boolean	Invalidate gantry axis grouping	(0)	-	re
37200	COUPLE_POS_TOL_COARSE	Double	Threshold value for "synchronization coarse"	0.0 ~ + (1.0)	mm, deg	cf
37210	COUPLE_POS_TOL_FINE	Double	Threshold value for "synchronization fine"	0.0 ~ + (0.5)	mm, deg	cf
37220	COUPLE_VELO_TOL_COARSE	Double	Velocity tolerance "coarse" between leading and following spindles	0.0 ~ + (1.0)	mm/min, rev/min	cf
37230	COUPLE_VELO_TOL_FINE	Double	Velocity tolerance "fine" between leading and following spindles	0.0 ~ + (0.5)	mm/min, rev/min	cf
37300	DIG_P_MIN	Double	Lower operating range limit (software limit) when digitizing	- ~ - (-100000000)	mm	po
37310	DIG_P_MAX	Double	Upper operating range limit (software limit) when digitizing	- ~ - (100000000)	mm	po
37320	DIG_V_MAX	Double	Maximum axis velocity during digitization	0.0 ~ + (10000.)	mm/min	po
37400	EPS_TLIFT_TANG_STEP	Double	Angle of tangent for corner recognition	- ~ - (5.0)	mm, deg	re
37402	TANG_OFFSET	Double	Default angle for tangential correction	- ~ - (0.0)	mm, deg	re
37500	ESR_REACTION	Byte	Axial mode of "Extended Stopping and Retract"	0 ~ 22 (0)	-	cf

37550	EG_VEL_WARNING	Double	Threshold for "Velocity warning threshold", "Acceleration warning threshold"	0 ~ 100 (90.0)	%	cf
37560	EG_ACC_TOL	Double	Threshold value for "Axis accelerating"	0.0 ~ + (25.0)	%	cf

2.5.9 Axis-Specific Memory Settings

38000	MM_ENC_COMP_MAX_POINTS[n]:0_max_enc._1	D word	Number of intermediate points for interpolatory compensation (SRAM)	0 ~ 5000 (0)	-	po
38010	MM_QEC_MAX_POINTS [0]	D word	Number of values for quadrant error compensation with neural network (SRAM)	0 ~ 1040 (0)	-	po

2.6 GENERAL SETTING DATA

Number	Name	Data type	Contents	Setting range (Default)	Unit	Active
41010	JOG_VAR_INCR_SIZE	Double	Size of the variable increment for JOG	(0)	-	im
41050	JOG_CONT_MODEL_ LEVELTRIGGRD	Boolean	JOG continuous: (1) jog mode/(0) continuour operation	(1)	-	im
41100	JOG_REV_IS_ACTIVE	Boolean	Jog mode: (1) revolution feedrate/ (0) feedrate	(0)	-	im
41110	JOG_SET_VELO	Double	Axis velocity in JOG	0.0 ~ + (0.0)	mm/min	im
41120	JOG_REV_VELO	Double	Revolutional feedrate of axes in JOG mode	0.0 ~ + (0.0)	mm/rev	im
41130	JOG_ROT_AX_SET_ VELO	Double	Axis velocity for rotary axes in JOG mode	0.0 ~ + (0.0)	rev/min	im
41200	JOG_SPIND_SET_VELO	Double	Speed for spindle JOG mode	0.0 ~ + (0.0)	rev/min	im
41300	CEC_TABLE_ENABLE [n]	Boolean	Default selection for compensation table	(0)	-	im
41310	CEC_TABLE_WEIGHT [n]	Double	Default factor selection for compensation tables	(1.0)	factor	im
41500	SW_CAM_MINUS_POS_ TAB_1[n]:0...7	Double	Switching points with falling edge of cams 1-8	(0.0)	mm, deg inch	im
41501	SW_CAM_PLUS_POS_ TAB_1[n]:0...7	Double	Switching points with rising edge of cams 1-8	(0.0)	mm, deg inch	im
41502	SW_CAM_MINUS_POS_ TAB_2[n]:0...7	Double	Switching points with falling edge of cams 9-16	(0.0)	mm, deg inch	im
41503	SW_CAM_PLUS_POS_ TAB_2[n]:0...7	Double	Switching points with rising edge of cams 9-16	(0.0)	mm, deg inch	im
41504	SW_CAM_MINUS_POS_ TAB_3[n]:0...7	Double	Switching points with falling cams 17-24	(0.0)	mm, deg inch	im
41505	SW_CAM_PLUS_POS_ TAB_3[n]:0...7	Double	Switching points with rising cams 17-24	(0.0)	mm, deg inch	im
41506	SW_CAM_MINUS_POS_ TAB_4[n]:0...7	Double	Switching points with falling cams 25-32	(0.0)	mm, deg inch	im
41507	SW_CAM_PLUS_POS_ TAB_4[n]:0...7	Double	Switching points with rising cams 25-32	(0.0)	mm, deg inch	im
41520	SW_CAM_MINUS_TIME_ TAB_1[n]:0...7	Double	Lead times for the "-" switching points of cams 1-8	(0.0)	sec	im
41521	SW_CAM_PLUS_TIME_ TAB_1[n]:0...7	Double	Lead times for the "+" switching points of cams 1-8	(0.0)	sec	im
41522	SW_CAM_MINUS_TIME_ TAB_2[n]:0...7	Double	Lead times for the "-" switching points of cams 9-16	(0.0)	sec	im
41523	SW_CAM_PLUS_TIME_ TAB_2[n]:0...7	Double	Lead times for the "+" switching points of cams 9-16	(0.0)	sec	im

41524	SW_CAM_MINUS_TIME_TAB_3[n]:0...7	Double	Lead times for the "-" switching points of cams 17-24	(0.0)	sec	im
41525	SW_CAM_PLUS_TIME_TAB_3[n]:0...7	Double	Lead times for the "+" switching points of cams 17-24	(0.0)	sec	im
41526	SW_CAM_MINUS_TIME_TAB_4[n]:0...7	Double	Lead times for the "-" switching points of cams 25-32	(0.0)	sec	im
41527	SW_CAM_PLUS_TIME_TAB_4[n]:0...7	Double	Lead times for the "+" switching points of cams 25-32	(0.0)	sec	im
41600	COMPAR_THRESHOLD_1[n]:0...7	Double	Threshold value of the 1st comparator	(0.0)	mv	im
41601	COMPAR_THRESHOLD_2[n]:0...7	Double	Threshold value of the 2nd comparator	(0.0)	mv	im
41700	AXCT_SWWIDTH[n]: 0...15	D word	Default rotation of axis container	0 ~ 2000 (0.0)	-	im

2.7 CHANNEL-SPECIFIC SETTING DATA

42000	THREAD_START_ANGLE	Double	Starting angle for thread	0.0 ~ + (0.0)	deg	im
42010	THREAD_RAMP_DISP_TIME	Double	Acceleration behavior of axis when thread cutting	-1. ~ 999999. (-1.)	mm	im
42100	DRY_RUN_FEED	Double	Dry run feedrate	0.0 ~ + (5000.)	mm/min	im
42300	COUPLE_RATIO_1[n]: 0...1	Double	Speed ratio for synchronous spindle mode, numerator	-100000000 ~ 100000000 (1.)	-	im
42400	PUNCH_DWELLTIME	Double	Dwell time for punching and nibbling	0.0 ~ + ([0]=1.)	sec	im
42402	NIBPUNCH_PRE_START_TIME	Double	Delay time (punch/nibble) with G603	0.0 ~ + ([0]=0.02)	sec	im
42440	FRAME_OFFSET_INCR_TIME	Boolean	Traversing from zero offset with incr. programming	(1)	-	im
42442	TOOL_OFFSET_INCR_TIME	Boolean	Traversing from zero offset with incr. programming	(1)	-	im
42444	TARGET_BLOCK_INCR_PROG	Boolean	Set down mode after search run with calculation	(1)	-	im
42450	CONTPREC	Double	Contour accuracy	0.000001 ~ 999999. (0.1)	mm	im
42460	MINFEED	Double	Minimum path feedrate for CPRECON	0.000001 ~ 999999. (1.)	mm/min	im
42470	CRIT_SPLINE_ANGLE	Double	Critical angle of spline and polynomial interpolation and compressor	(0.0)	-	im
42480	STOP_CUTCOM_STOPRE	Boolean	Alarm response with tool radius compensation and preprocessing stop	(1)	-	im
42490	CUTCOM_G40_STOPRE	Boolean	Retraction behavior of TRC with prep. stop	(0)	-	im
42500	SD_MAX_PATH_ACCEL	Double	Max. path acceleration	1.0e-3 ~ (10000)	mm/s^2	im
42502	IS_SD_MAX_PATH_ACCEL	Boolean	Evaluate SD_MAX_PATH_ACCEL	(0)	-	im
42510	SD_MAX_PATH_JERK	Double	Max. path-related jerk as SD	0.0 ~ + (100000)	mm/s^2	im
42512	IS_SD_MAX_PATH_JERK	Boolean	Evaluate SD SD_MAX_PATH_JERK	(0)	-	im
42600	JOG_FEED_PER_REV_SOURCE	D word	Control revolutional feedrate in JOG	-1 ~ 31 (0)	-	im
42700	EXT_PROG_PATH	String	Program path for external	,,,,,,,,,,,,,,,	-	im
42800	SPIND_ASSIGN_TAB [n]:0...5	Byte	subroutine call EXTCALL Spindle number converter	0 ~ (0,1,2,...)	-	im
42900	MIRROR_TOOL_LENGTH	Boolean	Sign change of tool length with mirror image machining	(0)	-	im
42910	MIRROR_TOOL_WEAR	Boolean	Sign change of tool wear with mirror image machining	(0)	-	im
42920	WEAR_SIGN_CUTPOS	Boolean	Sign of tool wear depending on tool point direction	(0)	-	im
42930	WEAR_SIGN	Boolean	Sign of wear	(0)	-	im
42940	TOOL_LENGTH_CONST	D word	Change of tool length components with change of active plane	(0)	-	im

2.8 AXIS-SPECIFIC SETTING DATA

43100	LEAD_TYPE	D word	Defines what is used as master value	0 ~ 2 (1)	-	im
43102	LEAD_OFFSET_IN_ POS	Double	Offset of master value if coupled to this axis	(0.0)	-	im
43104	LEAD_SCALE_IN_POS	Double	Scaling of master value if coupled to this axis	(1.0)	-	im
43106	LEAD_OFFSET_OUT_ POS	Double	Offset of the functional value of the curve table	(0.0)	-	im
43108	LEAD_SCALE_OUT_ POS	Double	Scaling of functional value of the curve table	(1.0)	-	im
43210	SPIND_MIN_VELO_G25	Double	Progr. spindle speed limitation G25	0.0 ~ + (0.0)	rev/min	im
43220	SPIND_MAX_VELO_G26	Double	Progr. spindle speed limitation G26	0.0 ~ + (1000)	rev/min	im
43230	SPIND_MAX_VELO_LIMS	Double	Spindle speed limitation with G96	0.0 ~ + (100)	rev/min	im
43300	ASSIGN_FEED_PER_ REV_SOURCE	D word	Revolutional feedrate for positioning axes/spindles	-1 ~ 31 (0)	-	im
43350	AA_OFF_LIMIT	Double	Upper limit of offset value $AA_OFF with clearance control	0.0 ~ + (100000000.)	rev/min	im
43400	WORKAREA_PLUS_ ENABLE	Boolean	Working area limitation active in positive direction	(0)	-	im
43410	WORKAREA_MINUS_ ENABLE	Boolean	Working area limitation active in the negative direction	(0)	-	im
43420	WORKAREA_LIMIT_PLUS	Double	Working area limitation plus	(100000000)	mm, deg	im
43430	WORKAREA_LIMIT_ MINUS	Double	Working area limitation minus	(-100000000)	mm, deg	im
43500	FIXED_STOP_SWITCH	Byte	Selection of travel to fixed stop	0 ~ 1 (0)	-	im
43510	FIXED_STOP_TORQUE	Double	Fixed stop clamping torque	0.0 ~ 800.0 (5.0)	%	im
43520	FIXED_STOP_WINDOW	Double	Fixed stop monitoring window	0.0 ~ + (1.0)	mm, deg	im
43700	OSCILL_REVERSE_POS1	Double	Oscillation reversal point 1	(0.0)	mm, deg	im
43710	OSCILL_REVERSE_POS2	Double	Oscillation reversal point 2	(0.0)	mm, deg	im
43720	OSCILL_DWELL_TIME1	Double	Hold time at oscillation reversal point 1	(0.0)	sec	im
43730	OSCILL_DWELL_TIME2	Double	Hold time at oscillation reversal point 2	(0.0)	sec	im
43740	OSCILL_VELO	Double	Feedrate of reciprocating axis	0.0 ~ + (0.0)	mm/min rev/min	im
43750	OSCILL_NUM_SPARK_ CYCLES	D word	Number of sparking out strokes	0.0 ~ + (0)	-	im
43760	OSCILL_END_POS	Double	End position of the reciprocating axis	(0.0)	mm, deg	im
43770	OSCILL_CTRL_MASK	D word	Oscillation sequence control screenform	(0)	-	im
43780	OSCILL_IS_ACTIVE	Boolean	Switch on oscillation movement	(0)	-	im
43900	TEMP_COMP_ABS_ VALUE	Double	Position-independent temperature compensation value	(0.0)	mm, deg	im
43900	TEMP_COMP_SLOPE	Double	Lead angle for position-dependent temperature compensation	(0.0)	-	im
43920	TEMP_COMP_REF_ POSITION	Double	Reference position for position-dependent temperature compensation	(0.0)	mm, deg	im

2.9 GUD Parameters

1000	Thread chamfering amount (0.1~Lead)
1001	Thread chamfering angle (deg)
1002	Transition time to the good night screen
1003	Setting time for the work light off function in the Ecoeco setting.
1004	Setting time for the chip conveyor auto off function in the Ecoeco setting.
1005	Channel axis No. of the axis that drives the tail stock or sub spindle.
1006	Machine axis No. of the reference axis for the Z-axis tool nose coordinate system.
1007	Sequential No. (1~3)
1008	Maximum number of the turret faces.
1009	Thinning times of the load display.
1010	Maximum torque of the machine axis 1 for the load display (% against rating).
1011	Maximum torque of the machine axis 2 for the load display (% against rating).
1012	Maximum torque of the machine axis 3 for the load display (% against rating).
1013	Maximum torque of the machine axis 4 for the load display (% against rating).
1014	Maximum torque of the machine axis 5 for the load display (% against rating).
1015	Maximum torque of the machine axis 6 for the load display (% against rating).
1016	Maximum torque of the machine axis 7 for the load display (% against rating).
1017	Maximum torque of the machine axis 8 for the load display (% against rating).
1018	Maximum torque of the machine axis 9 for the load display (% against rating).
1019	Maximum torque of the machine axis 10 for the load display (% against rating).
1020	Maximum torque of the machine axis 11 for the load display (% against rating).
1021	Maximum torque of the machine axis 12 for the load display (% against rating).
1022	Spindle AV_HIGH (%)
1023	Spindle AV_LOW (%)
1024	X axis AV_HIGH (%)
1025	X axis AV_LOW (%)
1026	Y axis AV_HIGH (%)
1027	Y axis AV_LOW (%)
1028	Z axis AV_HIGH (%)
1029	Z axis AV_LOW (%)
1030	Spindle cancel time (*100ms)
1031	Spindle overload judgment time (*100ms)
1032	Spindle wear judgment time (*100ms)
1033	X axis cancel time (*100ms)
1034	X axis overload judgment time (*100ms)
1035	X axis wear judgment time (*100ms)
1036	Y axis cancel time (*100ms)
1037	Y axis overload judgment time (*100ms)

1038	Y axis wear judgment time (*100ms)
1039	Z axis cancel time (*100ms)
1040	Z axis overload judgment time (*100ms)
1041	Z axis wear judgment time (*100ms)
1042	Adaptation upper limit
1043	Adaptation lower limit
1044	Adaptation maximum override
1045	Adaptation minimum override
1046	Adaptation override step
1047	Adaptation descent judgment time (*100ms)
1048	Adaptation rise judgment time (*100ms)
1049	Spindle data average times
1050	Feed shaft data average times
1051	Time to change the date of the flight recorder
1052	Override value during operation to pull out the direct tap (%).
1131	Calling out of M code sub program (M code to call out O9001)
1132	Calling out of M code sub program (M code to call out O9002)
1133	Calling out of M code sub program (M code to call out O9003)
1134	Calling out of M code sub program (M code to call out O9004)
1135	Calling out of M code sub program (M code to call out O9005)
1136	Calling out of M code sub program (M code to call out O9006)
1137	Calling out of M code sub program (M code to call out O9007)
1138	Calling out of M code sub program (M code to call out O9008)
1139	Calling out of M code sub program (M code to call out O9009)
1140	Calling out of arbitrary G code (G code to call out O9010)
1141	Calling out of arbitrary G code (G code to call out O9011)
1142	Calling out of arbitrary G code (G code to call out O9012)
1143	Calling out of arbitrary G code (G code to call out O9013)
1144	Calling out of arbitrary G code (G code to call out O9014)
1145	Calling out of arbitrary G code (G code to call out O9015)
1146	Calling out of arbitrary G code (G code to call out O9016)
1147	Calling out of arbitrary G code (G code to call out O9017)
1148	Calling out of arbitrary G code (G code to call out O9018)
1149	Calling out of arbitrary G code (G code to call out O9019)
1150	Calling out of M code macro (M code to call out O9020)
1151	Calling out of M code macro (M code to call out O9021)
1152	Calling out of M code macro (M code to call out O9022)
1153	Calling out of M code macro (M code to call out O9023)
1154	Calling out of M code macro (M code to call out O9024)
1155	Calling out of M code macro (M code to call out O9025)

1156	Calling out of M code macro (M code to call out O9026)
1157	Calling out of M code macro (M code to call out O9027)
1158	Calling out of M code macro (M code to call out O9028)
1159	Calling out of M code macro (M code to call out O9029)

2000	Turret clamp axis, clamp position
2001	Turret clamp axis, approach position
2002	Turret clamp axis, turret revolution possible position
2003	Turret clamp axis, retreat position
2004	Turret clamp axis, clamp torque
2005	Turret clamp axis, pressing feedrate
2006	
2007	
2008	
2009	
2010	
2011	Digital tail stock, pressing error (mm)
2012	Digital tail stock, approach position C (mm)
2013	Thrust (kn/cm^2)
2014	Clamp thrust (kn/cm^2)
2015	Digital chuck opening amount (mm)
2016	Digital tail stock, pressing speed
2017	Digital tail stock, ZB telling position
2018	Digital tail stock, retreat position
2019	Digital tail stock, re-chuck specification
2020	Digital tail stock, chuck open/close timer (0.1 sec)
2021	Digital tail stock, 100% thrust (kn/cm^2)
2022	Digital tail stock, lower thrust (%)

8000	Inch/mm change (00H: mm, FFH: inch)	
8001	Tool related layout creation	
	0Bit	Auto program tool data Read (0: Invalid, 1: Valid) Multi tool file→NC
	1Bit	Auto program tool data Write (0: Invalid, 1: Valid) NC→Multi (Note) When 0Bit is valid, enabled by 1.
	2Bit	Clear the tool type (0: Yes, 1: No)
	3Bit	Clear the tool name (0: Yes, 1: No)
	4Bit	Set the L data to the machining reference point shift amount Z (0: Yes, 1: No)
	5Bit	Set the W data to the work length Z (0: Yes, 1: No)
8002		
	0Bit	Pre-notice of machining completion (0: Invalid, 1: Valid)
8003	Measurement related	
	0Bit	With Q setter repeat, confirmation of door close (0: Yes, 1: No)
	1Bit	Measurement times of Q setter repeat (0: Once, 1: 3 times)
	2Bit	With Q setter repeat, check of touch signal (0: Valid, 1: Invalid)
	3Bit	With Q setter repeat, Measurement of the rotary tool (0: Unable, 1: Able)
	4Bit	Q setter interlock (0: Invalid, 1: Valid)
	5Bit	
	6Bit	
	7Bit	Check of Q setter barrier (0: Invalid, 1: Valid)
8004	Stroke limit related	
	0Bit	Prohibition area of stroke limit 2 (0: Inside, 1: Outside)
	1Bit	Stroke limit 3 (0: Invalid, 1: Valid)
	2Bit	Stroke limit 2 of the axis vertical to the plane (0: Invalid, 1: Valid)
	3Bit	Stroke limit 3 of the axis vertical to the plane (0: Invalid, 1: Valid)
8005	Cutting monitor related	
	0Bit	Monitor of X axis (0: Absolute value method, 1: Reference value method)
	1Bit	Monitor of Y axis (0: Absolute value method, 1: Reference value method)
	2Bit	Monitor of Z axis (0: Absolute value method, 1: Reference value method)
	3Bit	
8006	DI/DO related	
	0Bit	
	1Bit	Valid/Invalid of the work light off function in the Ecoeco setting.
	2Bit	Valid/Invalid of the chip conveyor auto off function in the Ecoeco setting.
8007	Display and edit related	
	0Bit	O8000~9999 Program edit
	1Bit	O8000~9999 Display
8008	Maintenance related	
	0Bit	Re-write of parameters
8009	Display language	
	0~3Bit	Display language (0: Japanese, 1: English, 2: German)

8010	Auto Nose R compensation related	
	1Bit	Interference check: Offset vector 90°~270° (0: Valid, 1: Invalid)
	2Bit	Interference check: For all (0: Valid, 1: Invalid)
8011	Auto Nose R compensation related	
	0Bit	If the block which does not move during tool nose compensation appears for more than 3 blocks in a row (including the case caused by pre-reading stop command): 0: Creates a vertical offset vector at the ending point of the current block. 1: Temporarily clears the offset vector at the ending point of the current block.
	1Bit	Where to start up (0: Block of G00, 1: Block of G00 or G01)
8012	FLexi macro related	
	0Bit	Calling out of T code sub program (Call out/Not call out O9000)
	1Bit	Calling out of S code sub program (Call out/Not call out O9029)
	2Bit	Calling out of 2nd auxiliary function sub program (Call out/Not call out O9028)
8013	Program related	
	0Bit	E code at thread cutting (0: Screw lead, 1: Threads per inch)
8014	Boring fixed cycle related	
	0Bit	Single block stop at each step of boring fixed cycle (0: Yes, 1: No)
8020	Channel 1st axis, minimum setting unit	
	0~2Bit	Minimum setting unit (0: IS-B, 1: IS-B, 2: IS-C)
8021	Channel 2nd axis, minimum setting unit	
	0~2Bit	Minimum setting unit (0: IS-B, 1: IS-B, 2: IS-C)
8022	Channel 3rd axis, minimum setting unit	
	0~2Bit	Minimum setting unit (0: IS-B, 1: IS-B, 2: IS-C)
8023	Channel 4th axis, minimum setting unit	
	0~2Bit	Minimum setting unit (0: IS-B, 1: IS-B, 2: IS-C)
8024	Channel 5th axis, minimum setting unit	
	0~2Bit	Bit Minimum setting unit (0: IS-B, 1: IS-B, 2: IS-C)
8025	Channel 6th axis, minimum setting unit	
	0~2Bit	Minimum setting unit (0: IS-B, 1: IS-B, 2: IS-C)
8026	Channel 7th axis, minimum setting unit	
	0~2Bit	Minimum setting unit (0: IS-B, 1: IS-B, 2: IS-C)
8027	Channel 8th axis, minimum setting unit	
	0~2Bit	Minimum setting unit (0: IS-B, 1: IS-B, 2: IS-C)
8028	Command unit of F	
	0Bit	Inch per revolution (0: 3 figures, 1: 4 figures)
	1Bit	mm per revolution (0: 2 figures, 1: 3 figures)
	2Bit	Inch per minute (0: 1 figure, 1: 2 figures)
	3Bit	mm per minute (0: 0 figure, 1: 1 figure)
	4Bit	Inch thread (0: 6 figures, 1: 7 figures)
	5Bit	mm thread (0: 5 figures, 1: 6 figures)

2.10 Maker Definition Parameters

61200	MN_CC_SAP1_WORK_LEN[2]	Double	Set the work length of the tool nose coordinate system. Convert inch/mm.		POSN_LIN	re
	MN_CC_SAP1_WORK_LEN[0] MN_CC_SAP1_WORK_LEN[1]	Work length 1 Work length 2				
62200	MC_CC_SAP1_POSN_LIN[30]	Double	Using as a parameter of the position or length, convert inch/mm.		POSN_LIN	re
	MC_CC_SAP1_POSN_LIN[0]	Neglect limit value of nose R offset, when moving outside the corner (0.030)				
	MC_CC_SAP1_POSN_LIN[1]	Increment input clamp value when inputting tool offset (1.0)				
	MC_CC_SAP1_POSN_LIN[2]	Q setter re-touch return amount				
	MC_CC_SAP1_POSN_LIN[3]	Q setter offset input clamp value (1.0)				
	MC_CC_SAP1_POSN_LIN[4]	Q setter contact surface + Side coordinate value X				
	MC_CC_SAP1_POSN_LIN[5]	Q setter contact surface + Side coordinate value Z				
	MC_CC_SAP1_POSN_LIN[6]	Q setter contact surface - Side coordinate value X				
	MC_CC_SAP1_POSN_LIN[7]	Q setter contact surface - Side coordinate value Z				
	MC_CC_SAP1_POSN_LIN[8]	Q setter barrier coordinate value X				
	MC_CC_SAP1_POSN_LIN[9]	Q setter barrier coordinate value Z				
	MC_CC_SAP1_POSN_LIN[10]	Sensor length of Z sensor				
	MC_CC_SAP1_POSN_LIN[11]	Thrusting amount of Q setter repeat				
	MC_CC_SAP1_POSN_LIN[12]	Approach clearance amount of Q setter repeat				
	MC_CC_SAP1_POSN_LIN[13]	Right side clearance amount of Q setter repeat				
	MC_CC_SAP1_POSN_LIN[14]	Left side clearance amount of Q setter repeat				
	MC_CC_SAP1_POSN_LIN[15]	Plus direction X axis machine coordinate value of stroke limit 2				
	MC_CC_SAP1_POSN_LIN[16]	Plus direction Y axis machine coordinate value of stroke limit 2				
	MC_CC_SAP1_POSN_LIN[17]	Plus direction Z axis machine coordinate value of stroke limit 2				
	MC_CC_SAP1_POSN_LIN[18]	Minus direction X axis machine coordinate value of stroke limit 2				
	MC_CC_SAP1_POSN_LIN[19]	Minus direction Y axis machine coordinate value of stroke limit 2				
	MC_CC_SAP1_POSN_LIN[20]	Minus direction Z axis machine coordinate value of stroke limit 2				
	MC_CC_SAP1_POSN_LIN[21]	Plus direction X axis machine coordinate value of stroke limit 3				
	MC_CC_SAP1_POSN_LIN[22]	Plus direction Y axis machine coordinate value of stroke limit 3				
	MC_CC_SAP1_POSN_LIN[23]	Plus direction Z axis machine coordinate value of stroke limit 3				
	MC_CC_SAP1_POSN_LIN[24]	Minus direction X axis machine coordinate value of stroke limit 3				
	MC_CC_SAP1_POSN_LIN[25]	Minus direction Y axis machine coordinate value of stroke limit 3				
	MC_CC_SAP1_POSN_LIN[26]	Minus direction Z axis machine coordinate value of stroke limit 3				
	MC_CC_SAP1_POSN_LIN[27]					

62210	MC_CC_SAP1_VELO_LIN	Double	Using as a parameter of the speed, convert inch/mm.		VELO_LIN	re
	MC_CC_SAP1_VELO_LIN[0] MC_CC_SAP1_VELO_LIN[1] MC_CC_SAP1_VELO_LIN[2]	Feed speed when touching Q setter repeat Return speed of Q setter repeat from touching position				

IV. DIAGNOSIS

1. DIAGNOSIS DISPLAY

① Press AUX. and move the cursor to the window you want to change.

② Press Menu Select .

③ Press F9/NEXT and F8/Diagnose to display the diagnose screen.

④ Enter the DB number you want to display.

Example: DB10.DBB7

⑤ The “status” is displayed on the screen.

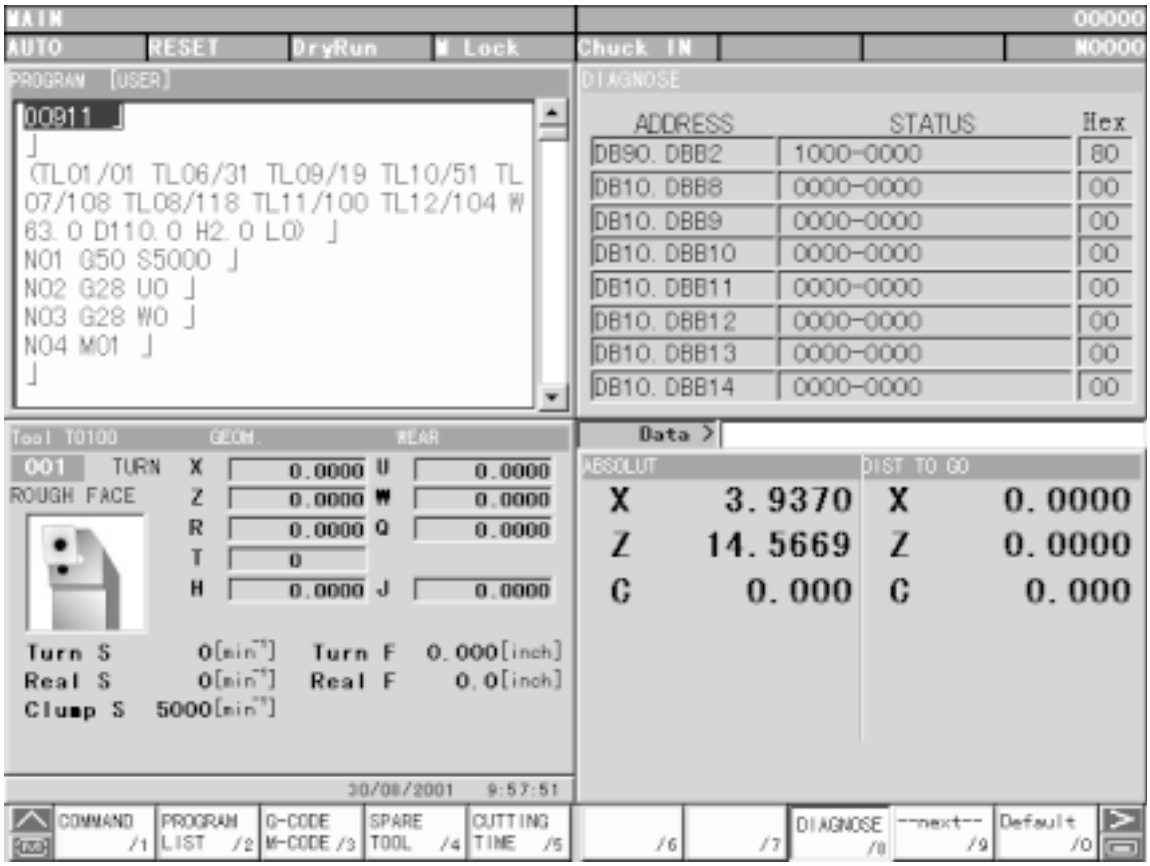


Fig. 1 Diagnose screen

1.1 PLC/NC INTERFACE SIGNAL

General

In the following list of interface signals, a reference to relevant documentation is provided for every signal. This reference specifies the section number or the short designation of the description of functions, please refer to

Reference : /FB/,xx, "yyy"

xx Short designation of individual description of functions (e.g.: /A2/).

yyy Name of description of functions (e.g.: "Various interface signals" or the title of the guide).

Inverse signal

Signals marked with "*" are so-called inverse signals. These signals initiate the appropriate function when a 0 signal appears rather than a 1 signal.

1.1.1 PLC Messages (DB2)

DB2	Signals for PLC message (PLC→MMC), /P3/							
Byte	7	6	5	4	3	2	1	0
	Channel1							
0	510007	510006	510005	510004	510003	510002	510001	510000
	Feed disable (Alarm no.: 510000-510015)							
1	510015	510014	510013	510012	510011	510010	510009	510008
2-5	Feed/read-in disable (Alarm no. 510100-510131)							
6-9	Read-in disable (Alarm no. 510200-510231)							
10-11	NC start disable (Alarm no. 510300-510315)							
12-13	Feed start GEO axis 1 (Alarm no. 511100-511115)							
14-15	Feed start GEO axis 2 (Alarm no. 511200-511215)							
16-17	Feed start GEO axis 3 (Alarm no. 511300-511315)							
	Channel 2							
18	520007	520006	520005	520004	520003	520002	520001	520000
	Feed disable (Alarm no.: 520000-520015)							
19	520015	520014	520013	520012	520011	520010	520009	520008
20-23	Feed/read-in disable (Alarm no. 520200-520131)							
24-27	Read-in disable (Alarm no. 520200-520231)							
28-29	NC start disable (Alarm no. 520300-520315)							
30-31	Feed stop GEO axis 1 (Alarm no. 521100-521115)							
32-33	Feed stop GEO axis 2 (Alarm no. 521200-521215)							
34-35	Feed stop GEO axis 3 (Alarm no. 521300-521315)							
36-143	The same as from channel 3, see the next table.							

Area	Address	Signal number
Channel 1, see above	DBX0.0-DBX11.7	510.000-510.231
Channel 1, geo axes	DBX12.0-DBX17.7	511.100-511.315
Channel 2, see above	DBX18.0-DBX29.7	520.000-520.231
Channel 2, geo axes	DBX30.0-DBX35.7	521.100-521.315
Channel 3	DBX36.0-DBX47.7	530.000-530.231
Channel 3, geo axes	DBX48.0-DBX53.7	531.100-531.315

Channel 4	DBX54.0-DBX65.7	540.000-540.231
Channel 4, geo axes	DBX66.0-DBX71.7	541.100-541.315
Channel 5	DBX72.0-DBX83.7	550.000-550.231
Channel 5, geo axes	DBX84.0-DBX89.7	551.100-551.315
Channel 6	DBX90.0-DBX101.7	560.000-560.231
Channel 6, geo axes	DBX102.0-DBX107.7	561.100-561.315
Channel 7	DBX108.0-DBX119.7	570.000-570.231
Channel 7, geo axes	DBX120.0-DBX125.7	571.100-571.315
Channel 8	DBX126.0-DBX137.7	580.000-580.231
Channel 8, geo axes	DBX138.0-DBX143.7	581.100-581.315
Channel 9, channel 10 in SW5 not implemented.		

	Axis/spindle							
144	600107	600106	600105	600104	600103	600102	600101	600100
	Axis/spindle 1 feed stop/spindle stop (Alarm no. 600100-600115)							
145	600115	600114	600113	600112	600111	600110	600109	600108
146-147	Axis/spindle 2 feed start/spindle stop (Alarm no. 600200-600215)							
148-149	Axis/spindle 3 feed start/spindle stop (Alarm no. 600300-600315)							
150-151	Axis/spindle 4 feed start/spindle stop (Alarm no. 600400-600415)							
152-153	Axis/spindle 5 feed start/spindle stop (Alarm no. 600500-600515)							
154-155	Axis/spindle 6 feed start/spindle stop (Alarm no. 600600-600615)							
156-157	Axis/spindle 7 feed start/spindle stop (Alarm no. 600700-600715)							
158-159	Axis/spindle 8 feed start/spindle stop (Alarm no. 600800-600815)							
160-161	Axis/spindle 9 feed start/spindle stop (Alarm no. 600900-600915)							
162-163	Axis/spindle 10 feed start/spindle stop (Alarm no. 601000-601015)							
164-165	Axis/spindle 11 feed start/spindle stop (Alarm no. 601100-601115)							
166-167	Axis/spindle 12 feed start/spindle stop (Alarm no. 601200-601215)							
168-169	Axis/spindle 13 feed start/spindle stop (Alarm no. 601300-601315)							
170-171	Axis/spindle 14 feed start/spindle stop (Alarm no. 601400-601415)							
172-173	Axis/spindle 15 feed start/spindle stop (Alarm no. 601500-601515)							
174-175	Axis/spindle 16 feed start/spindle stop (Alarm no. 601600-601615)							
176-177	Axis/spindle 17 feed start/spindle stop (Alarm no. 601700-601715)							
178-179	Axis/spindle 18 feed start/spindle stop (Alarm no. 601800-601815)							
	Axes 19-31 not implemented in SW5.							
	User area 0							
180	70007	700006	700005	700004	700003	700002	700001	700000
...	Axis/spindle 1 feed start/spindle stop (Alarm no. 700000-700063)							
187	70063	700062	700061	700060	700059	700058	700057	700056
188-195	User area 1 (Alarm no. 700100-700163)							
...								
372-379	User area 24 (Alarm no. 702400-702463)							

(Note) In DB2, the assignment is made between message/alarm number, text and area identifier. All alarm or message bits are automatically transferred to the user interface (channel, axes/spindle) through appropriate parameter settings. If these parameter settings are not made, the bit transfer must be programmed in the user program. The user interface can be further influenced after the block for the error/operational messages has been called. Only signals of the channels and axes declared in the NC machine data can be transferred and texts displayed.

The user must acknowledge all error messages generated. Operational messages are displayed only for as long as the relevant condition prevails.
The number of user areas can be parameterized via FB1.
DB2/DB3 must be deleted after changing the configuration (FB1: MsgUser).

Definition of error and operational messages/P3/							
Byte no. of DB2/Error message EM or operational message OM.							
7/EM	6/EM	5/OM	4/OM	3/EM	2/EM	1/OM	0/EM
15/OM	14/EM	13/OM	12/EM	11/OM	10/EM	9/OM	8/OM
23/OM	22/OM	21/EM	20/EM	19/OM	18/EM	17/OM	16/EM
31/OM	30/EM	29/OM	28/EM	27/OM	26/OM	25/EM	24/EM
				35/OM	34/EM	33/OM	32/EM
151/OM	150/EM	149/OM	148/EM	147/OM	146/EM	145/OM	144/EM
159/OM	158/EM	157/OM	156/EM	155/OM	154/EM	153/OM	152/EM
187/OM	186/OM	185/OM	184/OM	183/EM	182/EM	181/EM	180/EM
195/OM	194/OM	193/OM	192/OM	191/EM	190/EM	189/EM	188/EM

Example: The alarms numbered from 510200 to 510207 can be generated via DB2, DB6 (read-in disable channel1). These alarms are defined as error messages as standard.

1.1.2 Signals from/to NC (DB10)

On-board input and output signal from NCK

DB10	Signals to NC (PLC→NC)							
Byte	7	6	5	4	3	2	1	0
DBB0	Disabling of digital NCK inputs /A2/ (SW2 and higher)							
	Digital inputs without hardware #				On-board inputs			
	Input 8	Input 7	Input 6	Input 5	Input 4	Input 3	Input 2	Input 1
DBB1	Setting of digital NCK inputs from PLC (SW2 and higher)							
	Digital inputs without hardware #				On-board inputs			
	Input 8	Input 7	Input 6	Input 5	Input 4	Input 3	Input 2	Input 1
DBB2,3 Unassigned								
DBB4	Disabling of digital NCK outputs /A2/ (SW2 and higher)							
	Digital outputs without hardware #				On-board outputs			
	Output 8	Output 7	Output 6	Output 5	Output 4	Output 3	Output 2	Output 1
DBB5	Overwrite screenform of digital NCK/A2/outputs (SW2 and higher)							
	Digital outputs without hardware #				On-board outputs			
	Output 8	Output 7	Output 6	Output 5	Output 4	Output 3	Output 2	Output 1
DBB6	Setting value of digital NCK outputs from PLC/A2/ (SW2 and higher)							
	Digital outputs without hardware #				On-board outputs			
	Output 8	Output 7	Output 6	Output 5	Output 4	Output 3	Output 2	Output 1
DBB7	Input screenform of digital NCK outputs/A2/ (SW2 and higher)							
	Digital outputs without hardware #				On-board outputs			
	Output 8	Output 7	Output 6	Output 5	Output 4	Output 3	Output 2	Output 1
DBB8-55	Reserved							

(Note)

#) Bits 4-7 of the digital input and NCK outputs can be processed by the PLC even though there are no hardware I/Os available for this. Therefore, these bits can be used in addition to the information exchange between NCK and PLC.

§) On the 840D, the digital inputs and outputs 1 to 4 of the NCK are physically on-board. On the FM-NC, there are no hardware I/Os for bit 0 to bit 3. These can be processed by the PLC according to #)

The external I/O signals from the NCK have been shifted to the range starting with DBB122.

General signals to NCK

DB10	Signals to NC (PLC→NC)							
Byte	7	6	5	4	3	2	1	0
DBB56	Keyswitch/A2/					Acknowledgement EMERGENCY STOP/N2/	EMERGENCY STOP /N2/	
	Position 3	Position 2	Position 1	Position 0				
DBB57								INC inputs in mode group area active
DBB 58-59								

External digital inputs of the NCK

DB10	Signals to NC (PLC→NC)							
Byte	7	6	5	4	3	2	1	0
DBB122	Disable the external digital NCK inputs (SW2 and higher)							
	Input 16	Input 15	Input 14	Input 13	Input 12	Input 11	Input 10	Input 9
DBB123	Values from the PLC for the external digital NCK inputs (SW2 and higher)							
	Input 16	Input 15	Input 14	Input 13	Input 12	Input 11	Input 10	Input 9
DBB124	Disable the external digital NCK inputs (SW2 and higher)							
	Input 24	Input 23	Input 22	Input 21	Input 20	Input 19	Input 18	Input 17
DBB125	Values from the PLC for the external digital NCK inputs (SW2 and higher)							
	Input 24	Input 23	Input 22	Input 21	Input 20	Input 19	Input 18	Input 17
DBB126	Disable the external digital NCK inputs (SW2 and higher)							
	Input 32	Input 31	Input 30	Input 29	Input 28	Input 27	Input 26	Input 25
DBB127	Values from the PLC for the external digital NCK inputs (SW2 and higher)							
	Input 32	Input 31	Input 30	Input 29	Input 28	Input 27	Input 26	Input 25
DBB128	Disable the external digital NCK inputs (SW2 and higher)							
	Input 40	Input 39	Input 38	Input 37	Input 36	Input 35	Input 34	Input 33
DBB129	Values from the PLC for the external digital NCK inputs (SW2 and higher)							
	Input 40	Input 39	Input 38	Input 37	Input 36	Input 35	Input 34	Input 33

External digital outputs of the NCK

DB10	Signals to NC (PLC→NCK)							
Byte	7	6	5	4	3	2	1	0
DBB130	Disable the external digital NCK outputs (SW2 and higher)							
	Output 16	Output 15	Output 4	Output 13	Output 12	Output 11	Output 10	Output 9
DBB131	Overwrite screenform for the external digital NCK outputs (SW2 and higher)							
	Output 16	Output 15	Output 4	Output 13	Output 12	Output 11	Output 10	Output 9
DBB132	Value from the PLC for the external digital NCK outputs (SW2 and higher)							
	Output 16	Output 15	Output 4	Output 13	Output 12	Output 11	Output 10	Output 9
DBB133	Default screenform for the external digital NCK outputs (SW2 and higher)							
	Output 16	Output 15	Output 4	Output 13	Output 12	Output 11	Output 10	Output 9
DBB134	Disable the external digital NCK outputs (SW2 and higher)							
	Output 24	Output 23	Output 22	Output 21	Output 20	Output 19	Output 18	Output 17
DBB135	Overwrite screenform for the external digital NCK outputs (SW2 and higher)							
	Output 24	Output 23	Output 22	Output 21	Output 20	Output 19	Output 18	Output 17
DBB136	Value from the PLC for the external digital NCK outputs (SW2 and higher)							
	Output 24	Output 23	Output 22	Output 21	Output 20	Output 19	Output 18	Output 17
DBB137	Default screenform for the external digital NCK outputs (SW2 and higher)							
	Output 24	Output 23	Output 22	Output 21	Output 20	Output 19	Output 18	Output 17
DBB138	Disable the external digital NCK outputs (SW2 and higher)							
	Output 32	Output 31	Output 30	Output 29	Output 28	Output 27	Output 26	Output 25
DBB139	Overwrite screenform for the external digital NCK outputs (SW2 and higher)							
	Output 32	Output 31	Output 30	Output 29	Output 28	Output 27	Output 26	Output 25
DBB140	Value from the PLC for the external digital NCK outputs (SW2 and higher)							
	Output 32	Output 31	Output 30	Output 29	Output 28	Output 27	Output 26	Output 25
DBB141	Default screenform for the external digital NCK outputs (SW2 and higher)							
	Output 32	Output 31	Output 30	Output 29	Output 28	Output 27	Output 26	Output 25
DBB142	Disable the external digital NCK outputs (SW2 and higher)							
	Output 40	Output 39	Output 38	Output 37	Output 36	Output 35	Output 34	Output 33
DBB143	Overwrite screenform for the external digital NCK outputs (SW2 and higher)							
	Output 40	Output 39	Output 38	Output 37	Output 36	Output 35	Output 34	Output 33
DBB144	Value from the PLC for the external digital NCK outputs (SW2 and higher)							
	Output 40	Output 39	Output 38	Output 37	Output 36	Output 35	Output 34	Output 33
DBB145	Default screenform for the external digital NCK outputs (SW2 and higher)							
	Output 40	Output 39	Output 38	Output 37	Output 36	Output 35	Output 34	Output 33

Analog input of the NCK (external)

DB10	Signals to NC (PLC→NCK)							
Byte	7	6	5	4	3	2	1	0
DBB146	Disable the analog NCK inputs							
	Input 8	Input 7	Input 6	Input 5	Input 4	Input 3	Input 2	Input 1
DBB147	Specified analog value for NCK from PLC							
	Input 8	Input 7	Input 6	Input 5	Input 4	Input 3	Input 2	Input 1
DBW148	Setpoint from PLC for analog input 1 of NCK							
DBW150	Setpoint from PLC for analog input 2 of NCK							
DBW152	Setpoint from PLC for analog input 3 of NCK							
DBW154	Setpoint from PLC for analog input 4 of NCK							
DBW156	Setpoint from PLC for analog input 5 of NCK							
DBW158	Setpoint from PLC for analog input 6 of NCK							
DBW160	Setpoint from PLC for analog input 7 of NCK							
DBW162	Setpoint from PLC for analog input 8 of NCK							
DBB164,165	Unassigned							

Analog outputs of the NCK (external)

DB10	Signals to NC (PLC→NCK)							
Byte	7	6	5	4	3	2	1	0
DBB166	Overwrite screenform for the analog NCK outputs							
	Output 8	Output 7	Output 6	Output 5	Output 4	Output 3	Output 2	Output 1
DBB167	Default screenform for the analog NCK outputs							
	Output 8	Output 7	Output 6	Output 5	Output 4	Output 3	Output 2	Output 1
DBB168	Disable the analog NCK outputs							
	Output 8	Output 7	Output 6	Output 5	Output 4	Output 3	Output 2	Output 1
DBB169	Reserved							
DBW170	Setpoint from PLC for analog output 1 of NCK							
DBW172	Setpoint from PLC for analog output 2 of NCK							
DBW174	Setpoint from PLC for analog output 3 of NCK							
DBW176	Setpoint from PLC for analog output 4 of NCK							
DBW178	Setpoint from PLC for analog output 5 of NCK							
DBW180	Setpoint from PLC for analog output 6 of NCK							
DBW182	Setpoint from PLC for analog output 7 of NCK							
DBW184	Setpoint from PLC for analog output 8 of NCK							

1.1.3 Signals from/to NCK/MMC

On-board NCK inputs and outputs

DB10	Signals from NC (NCK→PLC)							
Byte	7	6	5	4	3	2	1	0
DBB60					Actual value of the digital ON-BOARD inputs of the NCK			
					Input 4	Input 3	Input 2	Input 1
DBB 61-63								
DBB64	Setpoint for the digital outputs of the NCK without hardware				Setpoint for the digital on-board outputs of the NCK			
	Output 8	Output 7	Output 6	Output 5	Output 4	Output 3	Output 2	Output 1
DBB 65-67	Unassigned							
DBB68	Handwheel 1 moved							
DBB69	Handwheel 2 moved							
DBB70	Handwheel 3 moved							
DBB68	Modification counter inch/metric system of units							
DBB 72-96	Unassigned							

(Note) #) Although no associated hardware I/Os exist, the PLC can process bits 4-7 of the digital inputs and NCK outputs. Consequently, these bits can also be used to transfer information between the NCK and the PLC.

§) The digital inputs and outputs 1 to 4 of the NCK exist as on-board hardware for the 840D. No hardware I/Os are available for bits 0-3 of the FM-NC. In accordance with #), these can be processed by the PLC.

Selection/status signals from MMC

DB10	Signals from NC (NCK→PLC)							
Byte	7	6	5	4	3	2	1	0
DBB97 MMC→PLC					Channel number for handwheel 1/H1/ (SW2 and higher)			
					D	C	B	A
DBB98 MMC→PLC					Channel number for handwheel 2/H1/ (SW2 and higher)			
					D	C	B	A
DBB99 MMC→PLC					Channel number for handwheel 3/H1/ (SW2 and higher)			
					D	C	B	A
DBB100 MMC→PLC	Axis number for handwheel 1/H1 (SW2 and higher)							
	Machine axis	Handwheel selected	Contour handwheel	E	D	C	B	A
DBB101 MMC→PLC	Axis number for handwheel 2/H1 (SW2 and higher)							
	Machine axis	Handwheel selected	Contour handwheel	E	D	C	B	A
DBB102 MMC→PLC	Axis number for handwheel 2/H1 (SW4.1 and higher)							
	Machine axis	Handwheel selected	Contour handwheel	E	D	C	B	A
DBB103 MMC→PLC	MMC 101/ 102 battery alarm	MMC temperature limit	AT box ready					

General signals from NCK

DB10	Signals from NC (NCK→PLC)							
Byte	7	6	5	4	3	2	1	0
DBB104	NCK CPU ready /A2/					HHU ready	MCP2 ready	MCP1 ready
DBB105	Unassigned							
DBB106							Emergency stop active /N2/	
DBB107	Inch system	NCU link active					Probe actuated /M4/ Probe 2	Probe 1
DBB108	NC ready /A2/	Drive ready /FBA/	Drives in cyclic operation		MMC-CPU ready (MMC to OPI) /A2/	MMC-CPU ready (MMC to MPI) /A2/	MMC-CPU ready E_ MMC2 ready	
DBB109	NCK battery alarm /A2/	Air temp. alarm /A2/	Heat sink temp. alarm NCU573					NCK alarm present /A2/
DBB110	Software cams minus (SW2 and higher) /N3/							
	7	6	5	4	3	2	1	0
DBB111	Software cams minus (SW2 and higher) /N3/							
	15	14	13	12	11	10	9	8
DBB112	Software cams minus (SW4.1 and higher) /N3/							
	23	22	21	20	19	18	17	16
DBB113	Software cams minus (SW4.1 and higher) /N3/							
	31	30	29	28	27	26	25	24
DBB114	Software cams plus (SW2 and higher) /N3/							
	7	6	5	4	3	2	1	0
DBB115	Software cams plus (SW2 and higher) /N3/							
	15	14	13	12	11	10	9	8
DBB116	Software cams plus (SW4.1 and higher) /N3/							
	23	22	21	20	19	18	17	16
DBB117	Software cams plus (SW4.1 and higher) /N3/							
	31	30	29	28	27	26	25	24

(Note) Concerning NCK-CPU ready (DBX104.7):
This signal is the sign-of-life monitoring function for the NC. It must be included in the safety circuit of the machine.

Concerning MMC-CPU1 ready (DBX108.3 and DBX108.2)

If the MMC is connected to the operator panel interface (X101), bit 3 is set (default). When connecting to the PG MPI interface (X122), bit 2 is set.

External digital input and output signals of the NCK

DB10	Signals from NC (NCK→PLC) /A2/ (SW2 and higher)							
Byte	7	6	5	4	3	2	1	0
DBB186	Actual value of external digital NCK inputsl							
	Input 16	Input 15	Input 14	Input 13	Input 12	Input 11	Input 10	Input 9
DBB187	Actual value of external digital NCK inputs							
	Input 24	Input 23	Input 22	Input 21	Input 20	Input 19	Input 18	Input 17
DBB188	Actual value of external digital NCK inputs							
	Input 32	Input 31	Input 30	Input 29	Input 28	Input 27	Input 26	Input 25
DBB189	Actual value of external digital NCK inputs							
	Input 40	Input 39	Input 38	Input 37	Input 36	Input 35	Input 34	Input 33
DBB190	NCK setpoint for external digital NCK outputs							
	Output 16	Output 15	Output 14	Output 13	Output 12	Output 11	Output 10	Output 9
DBB191	NCK setpoint for external digital NCK outputs							
	Output 24	Output 23	Output 22	Output 21	Output 20	Output 19	Output 18	Output 17
DBB192	NCK setpoint for external digital NCK outputs							
	Output 32	Output 31	Output 30	Output 29	Output 28	Output 27	Output 26	Output 25
DBB193	NCK setpoint for external digital NCK outputs							
	Output 40	Output 39	Output 38	Output 37	Output 36	Output 35	Output 34	Output 33

Analog input and output signals of the NCK

DB10	Signals from NC (NCK→PLC) /A2/ (SW2 and higher)							
Byte	7	6	5	4	3	2	1	0
DBW194	Actual value for analog input 1 of the NCK							
DBW196	Actual value for analog input 2 of the NCK							
DBW198	Actual value for analog input 3 of the NCK							
DBW200	Actual value for analog input 4 of the NCK							
DBW202	Actual value for analog input 5 of the NCK							
DBW204	Actual value for analog input 6 of the NCK							
DBW206	Actual value for analog input 7 of the NCK							
DBW208	Actual value for analog input 8 of the NCK							
DBW210	Setpoint for analog output 1 of the NCK							
DBW212	Setpoint for analog output 2 of the NCK							
DBW214	Setpoint for analog output 3 of the NCK							
DBW216	Setpoint for analog output 4 of the NCK							
DBW218	Setpoint for analog output 5 of the NCK							
DBW220	Setpoint for analog output 6 of the NCK							
DBW222	Setpoint for analog output 7 of the NCK							
DBW224	Setpoint for analog output 8 of the NCK							

1.1.4 Signals from/to mode group (DB11-14)

Mode group-specific signals

DB11	Signals to mode group 1 (PLC→NCK) /K1/							
Byte	7	6	5	4	3	2	1	0
DBB0	Mode group reset	Mode group stop Axis plus spindle	Mode group stop	Mode change disable		Operating mode		
						JOG	MDA	AUTOMATIC
DBB1	Single block					Machine function		
	Type A	Type B				REF	REPOS	TEACH IN
DBB2	Machine function							
			var. INC	10000INC	1000INC	100INC	10INC	1INC
DBB3								

(Note) About machine function: Machine function defined centrally when signal “INC inputs in mode group area active” (DB10.DBX57.0) is set.

DB11	Signals from mode group 1 (NCK→PLC) /K1/							
Byte	7	6	5	4	3	2	1	0
DBB4 MMC→PLC						Strobe mode		
						JOG	MDA	AUTOM.
DBB5 MMC→PLC						Strobe machine function		
						REF	REPOS	TEACH IN
DBB6	All channels in reset state				Mode group ready	Active operating mode		
						JOG	MDA	AUTOM.
DBB7					Digitizing	Active machine function		
						REF	REPOS	TEACH IN

DB11	Signals to mode group 2 (PLC→NCK) /K1/							
Byte	7	6	5	4	3	2	1	0
DBB20	Mode group reset	Mode group stop Axis plus spindle	Mode group stop	Mode change disable		Operating mode JOG	MDA	AUTOMATIC
DBB21	Single block Type A	Type B				Machine function REF	REPOS	TEACH IN
DBB22	Machine function		var. INC	10000 INC	1000 INC	100 INC	10 INC	1 INC
DBB23	Unassigned							

(Note) About machine function: Machine function defined centrally when signal “INC inputs in mode group area active” (DB10.DBX57.0) is set.

DB11	Signals from mode group 2 (NCK→PLC) /K1/							
Byte	7	6	5	4	3	2	1	0
DBB24 MMC→PLC						Strobe mode JOG	MDA	AUTOMATIC
DBB25 MMC→PLC						Strobe machine function REF	REPOS	TEACH IN
DBB26	All channels in reset state				Mode group ready	Active operating mode JOG	MDA	AUTOMATIC
DBB27					Digitizing /FBD/ (SW2 and higher)	Active machine function REF	REPOS	TEACH IN

(Note) The other mode groups (mode group 3 to mode group 10) are also located in DB11 with the following initial bytes:

Mode group 3: DBB40 Mode group 7: DBB120
Mode group 4: DBB60 Mode group 8: DBB140
Mode group 5: DBB80 Mode group 9: DBB160
Mode group 7: DBB100 Mode group 10: DBB180

1.1.5 Signals for Safety SPL (safe programmable logic)

Parameterization section

DB18	Signals for Safety PLC (PCL→PLC)							
Byte	7	6	5	4	3	2	1	0
DBB0	INSEP valid (valid bit)							
	8th input byte	7th input byte	6th input byte	5th input byte	4th input byte	3th input byte	2th input byte	1th input byte
DBB1								
DBB2	OUTSEP valid (valid bit)							
	8th output byte	7th output byte	6th output byte	5th output byte	4th output byte	3th output byte	2th output byte	1th output byte
DBB3								
DBW4	INSEP_ADDR (address 1st input byte)							
DBW6	INSEP_ADDR (address 2nd input byte)							
DBW8	INSEP_ADDR (address 3rd input byte)							
DBW10	INSEP_ADDR (address 4th input byte)							
DBW12	INSEP_ADDR (address 5th input byte)							
DBW14	INSEP_ADDR (address 6th input byte)							
DBW16	INSEP_ADDR (address 7th input byte)							
DBW18	INSEP_ADDR (address 8th input byte)							
DBW20	OUTSEP_ADDR (address 1st output byte)							
DBW22	OUTSEP_ADDR (address 2nd output byte)							
DBW24	OUTSEP_ADDR (address 3rd output byte)							
DBW26	OUTSEP_ADDR (address 4th output byte)							
DBW28	OUTSEP_ADDR (address 5th output byte)							
DBW30	OUTSEP_ADDR (address 6th output byte)							
DBW32	OUTSEP_ADDR (address 7th output byte)							
DBW34	OUTSEP_ADDR (address 8th output byte)							
DBB36								SPL READY
DBB37								
Data area for SPL inputs/outputs								
DBD38	SPL_DATA.INSEP[1..32]							
DBD42	SPL_DATA.INSEP[33..64]							
DBD46	SPL_DATA.OUTSEP[1..32]							
DBD50	SPL_DATA.OUTSEP[33..64]							
Data area for user SPL								
DBD54	SPL_DATA.INSIP[1..32]							
DBD58	SPL_DATA.INSIP[33..64]							
DBD62	SPL_DATA.OUTSIP[1..32]							
DBD66	SPL_DATA.OUTSIP[33..64]							
DBD70	SPL_DATA.MARKERSIP[1..32]							
DBD74	SPL_DATA.MARKERSIP[33..64]							
Difference in level between NCK-PLC for diagnostics								
DBD78	SPL_DELTA.INSEP[1..32]							
DBD82	SPL_DELTA.INSEP[33..64]							
DBD86	SPL_DELTA.OUTSEP[1..32]							

DBD90	SPL_DELTA.OUTSEP[33..64]							
DBD94	SPL_DELTA.INSIP[1..32]							
DBD98	SPL_DELTA.INSIP[33..64]							
DBD102	SPL_DELTA.OUTSIP[1..32]							
DBD106	SPL_DELTA.OUTSIP[33..64]							
DBD110	SPL_DELTA.MARKERSIP[1..32]							
DBD114	SPL_DELTA.MARKERSIP[33..64]							
DBB118								CMDSI
DBB119								
DBD120	Error number 0=No error 1-320=Signal number starting from SPL_DATA.INSEP[1]							
DBD124	Level indicator of cross-checking (diagnostics option: how many SPL signals currently differ in level)							

1.1.6 Signals from/to operator panel (DB19)

DB19	Signals to operator panel (PLC→MMC)							
Byte	7	6	5	4	3	2	1	0
DBB0	Actual value in WCS 0=MCS/A2/			Clear recall alarms (MM 103 only)	Clear cancel Calarms (MMC103only)	Key disable A2/	Screen darkening A2/	Screen bright /A2/
DBB1	Reserved							
DBB2	Higraph first error display							
DBW4	Higraph first error display							
DBB6	Analog spindle 1, capacity in percent							
DBB7	Analog spindle 2, capacity in percent							
DBB8	Channel number of machine control panel to MMC							
DBB9								
DBB10	ShopMill control signal	Reserved for selection				Selection of tool offset	Selection of alarm area	Selection of program area
DBB11	Reserved for selection							
DBB12	V24 On	V24 Off	V24 external	V24 stop	COM1	COM2		
DBB13	Select	Load part program	Unload					
DBB14	0=act.FS 1=pas.FS	V24 act. FS: Index of file to be transferred in the standard list V24 pass. FS: Number of the control file for user file names						
DBB15	V24 act. FS: Index that specifies the axis, channel or tool no. V24 pass. FS: Index of the file to be transferred in the user list.							
DBB16	Part program handling: Number of the control file for user file names.							
DBB17	Part program handling: Index of the file to be transferred in the user list.							
DBB18	Reserved (test automation)							
DBB19	Reserved (signal counter)							

DB19	Signals from operator panel (MMC→PLC)							
Byte	7	6	5	4	3	2	1	0
DBB20	MCS/WCS Change-over /A2/	Simulation active		Recall alarm cleared MMC103	Cancel alarm cleared MMC103	Cancel key actuated	Screen is dark /A2/	
DBB21								
DBB22	Displayed channel number from the MMC							
DBB23								
DBB24	V24 status from PLC							
	V24 On	V24 Off	V24 external	V24 stop	Com1 active	Com2 active	OK	Error
DBB25	Error V24							
DBB 26-27	Reserved							
DBB28	Part program handling status							
	Select	Load	Unload		Active		OK	Error
DBB29	Error program handling							
DBB 30-39	Reserved							
DBB40	Mode group number							
DBB41	Channel number (FC9: ChanNO)							
DBB42								FC9: Start (Measure in JOG)
DBB43								
	PLC→MMC							
DBB44								Mode change disable

DBB45	FC9 out							
					StarErr	Error	Done	Active
DBB46	FC9: Ref reserved							
DBB48	Reserved							
DBB 50-99	Assignment as for DBB0 to DBB49 Switchover interface to MMC							
DBW100	ONL_REQUEST Online request from MMC MMC writes its client identification as online request (Bus type, MMC bus address)							
DBW102	ONL_CONFIRM Acknowledgement from PLC to online request PLC writes MMC client identification as acknowledgement (Bus type, MMC bus address)							
DBW104	PAR_CLIENT_IDENT MMC writes its client identification (Bus type, MMC bus address)							
DBB106	PAR_MMC_TYP Example: Main/sub operator panel/server							
DBB107	PAR_MSTT_ADR MMC writes address of MCP to be activated							
DBB108	PAR_STATUS PLC writes online enable for MMC.							
DBB109	PAR_Z_INFO PLC writes additional info about status.							
DBW120	MMC1_CLIENT_IDENT PLC writes PAR_CLIENT_IDENT to MMCx_CLIENT_IDENT when MMC goes online.							
DBB122	MMC1_TYP PLC writes PAR_MMC_TYP to MMCx_TYP when MMC goes online.							
DBB123	MMC1_MSTT_ADR PLC writes PAR_MSTT_ADR to MMCx_MSTT_ADR when MMC goes online.							
DBB124	MMC1_STATUS Connection status, MMC and PLC alternately write the requests/acknowledgements.							
DBB125	MMC1_Z_INFO Additional info connection status (pos./neg. acknowledgement, error messages...)							

DBB126					MMC1 ACTIVE CHANGED	MMC1 ACTIVE REQ	MMC1 MSTT SHIFT LOCK	MMC1 SHIFT LOCK
DBB 127-129	Reserved							
DBW130	MMC2_CLIENT_IDENT PLC writes PAR_CLIENT_IDENT to MMCx_CLIENT_IDENT when MMC goes online.							
DBB132	MMC2_CLIENT_IDENT PLC writes PAR_MMC_TYP to MMCx_TYP when MMC goes online.							
DBB133	MMC2_MSTT_ADR PLC writes PAR_MSTT_ADR to MMCx_MSTT_ADR when MMC goes online.							
DBB134	MMC2_STATUS Connection status, MMC and PLC alternately write the requests/acknowledgements.							
DBB135	MMC2_Z_INFO Additional info connection status (pos./neg. acknowledgement, error messages...)							
DBB136					MMC2 ACTIVE CHANGED	MMC2 ACTIVE REQ	MMC2 MSTT SHIFT LOCK	MMC2 SHIFT LOCK
DBB 137-139	Reserved							

1.1.7 PLC machine data

DB20	PLC machine data (PLC→operator)							
Byte	7	6	5	4	3	2	1	0
DBW0	INT values							
DBW								
DBW	ITN values							
DBB	Bit arrays							
DBB								
DBB	Bit arrays							
DBD	REAL values							
DBD	REAL values							

(Note) The initial and end addresses of the PLC machine data areas depend on the respective length indications of the partial areas. In general, the integer values start with the data byte 0. The upper limit is determined by the corresponding length indication. In general, the following bit arrays (2-decadehexadecimal numbers on input) start with the following even address. The real values follow directly the bit arrays and also start with an even address.

1.1.8 Signals from/to NCK channel (DB21-30)

(Channel 1 corresponds to DB21 and channel 2 to DB22)

DB21-30	Signals to NCK channel (PLC→NCK)							
Byte	7	6	5	4	3	2	1	0
DBB0		Activate dry run feedrate /V1/	Activate MD1 /K1/	Activate single block /K1/	Activate DRF /H1/			Execution from external source
DBB1	Activate program test /K1/	PLC action complete /K1/	CLC override /TE1/	CLC stop /TE1/	Time monitoring act. (tool management)	Synchronized action OFF	Enable protection zones /A3/	Activate referencing /R1/
DBB2	Skip block /K1/							
	/7	/6	/5	/4	/3	/2	/1	/0
DBB3	Nibbling and punching /N4/							
				Stroke delayed /N4/	Stroke not operating /N4/	Stroke suppression /N4/	Manual stroke enable /N4/	No stroke enable /N4/
DBB4	Feedrate override /V1/							
	H	G	F	E	D	C	B	A
DBB5	Rapid traverse override /V1/							
	H	G	F	E	D	C	B	A
DBB6	Feedrate override active /V1/	Rapid traverse override active /V/		Program level abort /K1/	Delete subroutine no.of passes	Delete distance-to-go /A2/	Read-in disable /K1/	Feed disable /V1/
DBB7	Reset /K1/			NC stop axes plus spindle /K1/	NC stop /K1/	NC stop to block limit /K1/	NC start /K1/	NC start disable /K1/
DBB8	Activate machine-related protection area /A3/ (SW2 and higher)							
	Area 8	Area 7	Area 6	Area 5	Area 4	Area 3	Area 2	Area 1
DBB9	Activate machine-related protection area /A3/ (SW2 and higher)							
							Area 10	Area 9
DBB10	Activate channel-specific protection area /A3/ (SW2 and higher)							
	Area 8	Area 7	Area 6	Area 5	Area 4	Area 3	Area 2	Area 1
DBB11	Activate channel-specific protection area /A3/ (SW2 and higher)							
							Area 10	Area 9

(Note) On Feedrate override active (DBX6.7):
Even if feedrate override is not active (=100%), the setting 0% is effective.
On Feedrate override (DBB4):
Either 31 positions (Gray code) with 31 MD for % evaluation or 0-200%, corresponding to the dual value in byte (201-255 max. 200%).
On Rapid traverse override (DBB5):
Either 31 positions (Gray code) with 31 MD for % evaluation or 0-100%, corresponding to the dual value in byte (101-155 max. 100%).

On Active single block (DBX0.4):
Select variant via “Write variable”.
On Delete distance-to-go (DBX6.2):
Effects only path axes and not positioning axes.

Control signals to geometry axes

DB21-30	Signals to NCK channels (PLC→NCK)							
Byte	7	6	5	4	3	2	1	0
DBB12	Geometry axis 1							
	Traversing keys /H1/		Rapid traverse	Traversing key	Feed	Activate handwheel /H1/		
	+	-	override /H1/	disable /H1/	stop /V1/		2	1
DBB13	Geometry axis 1 machine function /H1/							
			Var. INC	10000INC	1000INC	100INC	10INC	1INC
DBB14	OEM signals geometry axis 1							
DBB15	Geometry axis 1							
DBB16	Geometry axis 2							
	Traversing keys /H1/		Rapid traverse	Traversing key	Feed stop	Activate handwheel /H1/		
	+	-	override /H1/	disable /H1/	/V1/		2	1
DBB17	Geometry axis 2 machine function /H1/							
			Var. INC	10000INC	1000INC	100INC	10INC	1INC
DBB18	OEM signals geometry axis 2							
DBB19	Geometry axis 2							
DBB20	Geometry axis 3							
	Traversing keys /H1/		Rapid traverse	Traversing key	Feed stop	Activate handwheel /H1/		
	+	-	override /H1/	disable /H1/	/V1/		2	1
DBB21	Geometry axis 3 machine function /H1/							
			Var. INC	10000INC	1000INC	100INC	10INC	1INC
DBB22	OEM signals geometry axis 3							
DBB23	Geometry axis 3							

(Note) About machine function: Machine function only defined when signal “INC inputs in mode group area active” (DB10.DBX57.0) is not set.

Operating signals from MMC/status signals from NC channel

DB21-30	Signals from NCK channel (NCK→PLC, MMC→PLC, PLC→NCK)							
Byte	7	6	5	4	3	2	1	0
DBB24 MMC→PLC		Dry run feedrate selected /V1/	NO1 selected /K1/	Single block selected	DRF selected /H1/			Execution from external source selected
DBB25 MMC→PLC	Program test selected /K1/				Feedrate override for rapid traverse selected /V1/			
DBB26 MMC→PLC								Skip block selected /K1/ (SW2 and higher)
DBB27 MMC→PLC	Reserved							
DBB28 PLC→NCK	OEM channel signals							
DBB29 PLC→NCK	Do not disable tool	Switch off wear monitoring	Switch off workpiece counter	Activate PTP motion	Activate fixed feed 4 /FBMA/, /V1/ (SW4 and higher)	Activate fixed feed 3 /FBMA/, /V1/ (SW4 and higher)	Activate fixed feed 2 /FBMA/, /V1/ (SW4 and higher)	Activate fixed feed 1 /FBMA/, /V1/ (SW4 and higher)
DBB30 PLC→NCK				Neg. direction simulation contour handwheel	Simulation contour handwheel on	Activate contour handwheel		
						Handwheel 3	Handwheel 2	Handwheel 1
DBB31 PLC→NCK	Reserved							
DBB32 NCK→PLC		Last action block active /K1/	M00/M01 active /K1/	Approach block active /K1/	Action block active /K1/			Execution from external source active
DBB33 NCK→PLC	Program test active /K1/	Transformation active /K1/M1	M02/M03 active /K1/	Block search active /K1/	Handwheel override active (SW 2 and higher) /H1/	Revolutional feedrate active /V1/		Referencing active /R1/
DBB34 NCK→PLC	OEM channel signals feedback							
DBB35 NCK→PLC	Channel status /K1/			Program status /K1/				
	Reset	Interrupted	Active	Aborted	Interrupted	Stopped	Waiting	Running
DBB36 NCK→PLC	NCK alarm with processing stop present /A2/	Channel-specific NCK alarm present /A2/	Channel ready for operation (SW4 and higher)	Interrupt processing active /K1/	All axes stationary /B1/	All axes requiring reference points are referenced /R1/		

DBB37 NCK→PLC	Stop at block end with SBL is suppressed	Read-in enable is gnored /TE1/	CLC stopped upper limit /TE1/	CLC stopped ower limit /TE1/	CLC active /TE1/	Contour handwheel active		
						Handwheel 3 /H1/	Handwheel 2 /H1/	Handwheel 1 /H1/
DBB38 NCK→PLC	Nibbling and punching /N4/							
							Acknowle dgement manual stroke enable /N4/	Stroke enable active /N4/
DBB39 NCK→PLC								Protection zones not guaranteed

(Note) On Feedrate override for rapid traverse selected (DBX25.3):
Depending on this signal, the basic PLC program copies the feedrate override onto the rapid traverse override on the channel-specific interface.
On Program test selected (DBX25.7):
“Program test selected” means axis disable for all channel axes and spindles.

Status signals of geometry axes

DB21-30	Signal from NCK channel (NCK→PLC)							
Byte	7	6	5	4	3	2	1	0
DBB40	Geometry axis 1							
	Traverse command /H1/					Handwheel active /H1/		
	plus	minus					2	1
DBB41	Geometry axis 1 active machine function /H1/							
			Var. INC	10000INC	1000INC	100INC	10INC	1INC
DBB42	OEM signals geometry axis 1							
DBB43	Geometry axis 1							
DBB44 MMC→PLC								
DBB46	Geometry axis 2							
	Traverse command /H1/					Handwheel active /H1/		
	plus	minus					2	1
DBB47	Geometry axis 2 active machine function /H1/							
			Var. INC	10000INC	1000INC	100INC	10INC	1INC
DBB48	OEM signals geometry axis 2							

DBB49	Geometry axis 2							
DBB50 MMC→PLC								
DBB52	Geometry axis 3							
	Traverse command /H1/					Handwheel active /H1/		
	plus	minus					2	1
DBB53	Geometry axis 3 active machine function /H1/							
			Var. INC	10000INC	1000INC	100INC	10INC	1INC
DBB54	OEM signals geometry axis 3							
DBB55	Geometry axis 3							
DBB56 MMC→PLC								
DBB57								

Change signals on auxiliary function transfer from NC channel

DB21-30	Signals from NCK channel (NCK→PLC)							
Byte	7	6	5	4	3	2	1	0
DBB58				Machine unction 5 change /H2/	Machine function 4 change /H2/	Machine function 3 change /H2/	Machine function 2 change /H2/	Machine function 1 change /H2/
DBB59				Machine function 5 not decoded	Machine function 4 not decoded	Machine function 3 not decoded	Machine function 2 not decoded	Machine function 1 not decoded
DBB60		S function 3 quick	S function 2 quick	S function 1 quick		S function 3 change /H2/	S function 2 change /H2/	S function 1 change /H2/
DBB61		T function 3 quick	T function 2 quick	T function 1 quick		T function 3 change /H2/ (SW2 and higher)	T function 2 change /H2/ (SW2 and higher)	T function 1 change /H2/ (SE2 and higher)
DBB62		D function 1 quick	D function 1 quick	D function 1 quick		D function 3 change /H2/ (SW2 and higher)	D function 2 change /H2/ (SW2 and higher)	D function 1 change /H2/
DBB63				DL function 1 quick				DL function change
DBB64		H function 1 quick	H function 1 quick	H function 1 quick		H function 3 change /H2/	H function 2 change /H2/	H function 1 change /H2/
DBB65			F function 6 change /H2/	F function 5 change /H2/	F function 4 change /H2/	F function 3 change /H2/	F function 2 change /H2/	F function 1 change /H2/
DBB66				M function 5 quick	M function 4 quick	M function 3 quick	M function 2 quick	M function 1 quick
DBB67			F function 6 quick	F function 5 quick	F function 4 quick	F function 3 quick	F function 2 quick	F function 1 quick

(Note) For 10-decade T number, only the T function 1 change signal is available. For 5-decade D numbers, only the D function 1 change signal is available.

Transferred M/S functions

DB21-30	Signals from NCK channel (NCK→PLC)							
Byte	7	6	5	4	3	2	1	0
DBW68	Extended address M function 1 (binary) /H2/							
DBD70	M function 1 (binary) /H2/							
DBW74	Extended address M function 2 (binary) /H2/							
DBD76	M function 2 (binary) /H2/							
DBW80	Extended address M function 3 (binary) /H2/							
DBD82	M function 3 (binary) /H2/							
DBW86	Extended address M function 4 (binary) /H2/							
DBD88	M function 4 (binary) /H2/							
DBW92	Extended address M function 5 (binary) /H2/							
DBD94	M function 5 (binary) /H2/							
DBW98	Extended address S function 1 (binary) /H2/							
DBD100	S function 1 (REAL format) /H2/							
DBW104	Extended address S function 2 (binary) /H2/							
DBD106	S function 2 (REAL format) /H2/							
DBW110	Extended address S function 3 (binary) /H2/							
DBD112	S function 3 (REAL format) /H2/							

(Note) M functions are programmed in the part program in the INTEGER format (8 decades plus sign).
"REAL format" means: 24 bit mantissa and 8 bit exponent.

Transferred T/D/DL function

DB21-30	Signals from NCK channel (NCK→PLC)							
Byte	7	6	5	4	3	2	1	0
DBW116	Extended address T function 1 (16 bit Int)							
DBW118	T function 1 (binary) /H2/							
DBD118	For 8-decade T nos., T function 1 (32 bit DINT) is used in DBD118 (see note).							
DBW120	Extended address T function 2 (16 bit Int)							
DBW122	T function 2 (Int)							
DBW124	Extended address T function 3 (16 bit Int)							
DBW126	T function 3 (Int)							
DBB128								
DBB129	D function 1 (binary) /H2/							
DBW130	For 5-decade D nos., D function 1 (16 bit DINT) is used in DBD130 (see note).							
DBB130	Extended address D function 2 (8 bit Int)							
DBB131	D function 2 (8 bit Int)							
DBB132	Extended address D function 3 (8 bit Int)							
DBB133	D function 3 (8 bit Int)							
DBW134	Extended address DL function (16 bit Int)							
DBD136	LD function (REAL)							

(Note) With active tool management, programmed T functions are not output to the PLC.
8-decade T nos. are only available as T function 1.
Programmed D functions with names (e.g. D=CUTEDGE_1) cannot be output in ASCII format to the PLC.
5-decade D nos. are only available as D function 1.
The REAL format corresponds to floating point representation in STEP 7 (24 bit mantissa and 8 bit exponent). This floating point format supplies a maximum of 7 valid places.

Transferred H/F functions

DB21-30	Signal from NCK channel (NCK→PLC)							
Byte	7	6	5	4	3	2	1	0
DBW140	Extended address H function 1 (binary) /H2/							
DBD142	H function 1 (REAL or Dint) /H2/							
DBW146	Extended address H function 2 (binary) /H2/							
DBD148	H function 2 (REAL or Dint) /H2/							
DBW152	Extended address H function 3 (binary) /H2/							
DBD154	H function 3 (REAL or Dint) /H2/							
DBW158	Extended address F function 1 (binary) /H2/							
DBD160	F function 1 (REAL format) /H2/							
DBW164	Extended address F function 2 (binary) /H2/							
DBD166	F function 2 (REAL format) /H2/							
DBW170	Extended address F function 3 (binary) /H2/							
DBD172	F function 3 (REAL format) /H2/							
DBW176	Extended address F function 4 (binary) /H2/							
DBD178	F function 4 (REAL format) /H2/							
DBW182	Extended address F function 5 (binary) /H2/							
DBD184	F function 5 (REAL format) /H2/							
DBW188	Extended address F function 6 (binary) /H2/							
DBD190	F function 6 (REAL format) /H2/							

(Note) F functions are programmed in the part program in the REAL format.

The extended address of the F function contains an identifier with the following meaning:

0=path feed

1-31=machine axis number for feed with positioning axes.

The H function data type is dependent on MD 22110:

AUXFU_H_TYPE_INT

Decoded M signals (M0 - M99)

DB21-30	Signals from NCK channel (NCK→PLC)							
Byte	7	6	5	4	3	2	1	0
DBB194	Dynamic M functions							
	M07	M06	M05*	M04*	M03*	M02	M01	M00
DBB195	Dynamic M functions /H2/							
	M15	M14	M13	M12	M11	M10	M09	M08
DBB196	Dynamic M functions /H2/							
	M23	M22	M21	M20	M19	M18	M17	M16
DBB197	Dynamic M functions /H2/							
	M31	M30	M29	M28	M27	M26	M25	M24
DBB198	Dynamic M functions /H2/							
	M39	M38	M37	M36	M35	M34	M33	M32
DBB199	Dynamic M functions /H2/							
	M47	M46	M45	M44	M43	M42	M41	M40
DBB200	Dynamic M functions /H2/							
	M55	M54	M53	M52	M51	M50	M49	M48
DBB201	Dynamic M functions /H2/							
	M63	M62	M61	M60	M59	M58	M57	M56
DBB202	Dynamic M functions /H2/							
	M71	M70*	M69	M68	M67	M66	M65	M64
DBB203	Dynamic M functions /H2/							
	M79	M78	M77	M76	M75	M74	M73	M72
DBB204	Dynamic M functions /H2/							
	M87	M86	M85	M84	M83	M82	M81	M80
DBB205	Dynamic M functions /H2/							
	M95	M94	M93	M92	M91	M90	M89	M88
DBB206	Dynamic M functions /H2/							
					M99	M98	M97	M96
DBB207								

(Note) M function marked with * are not decoded in this bit array if a spindle is configured in the channel. In this case, these M functions are offered as extended M functions in DB21-30. DBB68ff and in the relevant axis DBDB31-61.DBB86ff.

Dynamic M functions (M00 to M99) are decoded by the basic PLC program.

The PLC user must use dynamic M functions in order to generate static M functions.

Active G functions

DB21-30	Signals from NCK channel (NCK→PLC)							
Byte	7	6	5	4	3	2	1	0
DBB208	Number of active G function of G function group 1 (binary) /K1/							
DBB209	Number of active G function of G function group 2 (binary) /K1/							
DBB210	Number of active G function of G function group 3 (binary) /K1/							
DBB211	Number of active G function of G function group 4 (binary) /K1/							
DBB212	Number of active G function of G function group 5 (binary) /K1/							
DBB213	Number of active G function of G function group 6 (binary) /K1/							
DBB214	Number of active G function of G function group 7 (binary) /K1/							
DBB215	Number of active G function of G function group 8 (binary) /K1/							
...								
DBB270	Number of active G function of G function group n-1 (binary) /K1/							
DBB271	Number of active G function of G function group n (binary) /K1/							

(Note) The active G functions of the groups are updated each time a G function or a mnemonic identifier (e.g. SPLINE) is programmed.
G functions within a G group are output as binary value, starting with 1.
A G function with the value 0 means that no G function is active for this G group.

Signals for protection areas from NC channel

DB21-30	Signals from NCK channel (NCK→PLC) (SW2 and higher)							
Byte	7	6	5	4	3	2	1	0
DBB272	Machine-related protection area preactivated /A3/.							
	Area 8	Area 7	Area 6	Area 5	Area 4	Area 3	Area 2	Area 1
DBB273	Machine-related protection area preactivated /A3/.							
							Area 10	Area 9
DBB274	Channel-specific protection area preactivated /A3/.							
	Area 8	Area 7	Area 6	Area 5	Area 4	Area 3	Area 2	Area 1
DBB275	Channel-specific protection area preactivated /A3/.							
							Area 10	Area 9
DBB276	Machine-related protection area violated /A3/.							
	Area 8	Area 7	Area 6	Area 5	Area 4	Area 3	Area 2	Area 1
DBB277	Machine-related protection area violated /A3/.							
							Area 10	Area 9
DBB278	Channel-specific protection area violated /A3/.							
	Area 8	Area 7	Area 6	Area 5	Area 4	Area 3	Area 2	Area 1
DBB279	Channel-specific protection area violated /A3/.							
							Area 10	Area 9

Instruction-controlled signals to NC channel

DB21-30	Signals from NCK channel (NCK→PLC) (SW4 and higher)							
Byte	7	6	5	4	3	2	1	0
DBB280							Synch. action request to NCK	D number request to NCK
DBB281							Synch. action request to NCK	
DBW282	Assignment D1							
DBW284	Assignment D2							
DBW286	Assignment D3							
DBW288	Assignment D4							
DBW290	Assignment D5							
DBW292	Assignment D6							
DBW294	Assignment D7							
DBW296	Assignment D8							
DBW298	Assignment D9							
DBB300	Disable synchronized actions /FBSY/							
	No.8	No.7	No.6	No.5	No.4	No.3	No.2	No.1
DBB301	Disable synchronized actions /FBSY/							
	No.16	No.15	No.14	No.13	No.12	No.11	No.10	No.9
DBB302	Disable synchronized actions /FBSY/							
	No.24	No.23	No.22	No.21	No.20	No.19	No.18	No.17
DBB303	Disable synchronized actions /FBSY/							
	No.32	No.31	No.30	No.29	No.28	No.27	No.26	No.25
DBB304	Disable synchronized actions /FBSY/							
	No.40	No.39	No.38	No.37	No.36	No.35	No.34	No.33
DBB305	Disable synchronized actions /FBSY/							
	No.48	No.47	No.46	No.45	No.44	No.43	No.42	No.41
DBB306	Disable synchronized actions /FBSY/							
	No.56	No.55	No.54	No.53	No.52	No.51	No.50	No.49
DBB307	Disable synchronized actions /FBSY/							
	No.64	No.63	No.62	No.61	No.60	No.59	No.58	No.57

(Note) The request signals are set by the user and reset by the basic program after transmission of the corresponding data.

Instruction-controlled signals from NC channel

DB21-30	Signals from NCK channel (NCK→PLC) (SW4 and higher)							
Byte	7	6	5	4	3	2	1	0
DBB308	Disable synchronized actions /FBSY/							
	No.8	No.7	No.6	No.5	No.4	No.3	No.2	No.1
DBB309	Disable synchronized actions /FBSY/							
	No.16	No.15	No.14	No.13	No.12	No.11	No.10	No.9
DBB310	Disable synchronized actions /FBSY/							
	No.24	No.23	No.22	No.21	No.20	No.19	No.18	No.17
DBB311	Disable synchronized actions /FBSY/							
	No.32	No.31	No.30	No.29	No.28	No.27	No.26	No.25
DBB312	Disable synchronized actions /FBSY/							
	No.40	No.39	No.38	No.37	No.36	No.35	No.34	No.33
DBB313	Disable synchronized actions /FBSY/							
	No.48	No.47	No.46	No.45	No.44	No.43	No.42	No.41
DBB314	Disable synchronized actions /FBSY/							
	No.56	No.55	No.54	No.53	No.52	No.51	No.50	No.49
DBB315	Disable synchronized actions /FBSY/							
	No.64	No.63	No.62	No.61	No.60	No.59	No.58	No.57
Cyclic	Signals interface NCK →PLC							
DBB316	Active G function							
								G00
DBB317	Cartesian point-to-point action							
	Tool missing	PTP motion active						External language mode active
DBB318~319								

Signals to orientation axes

DB21-30	Signals to NCK channel (PLC→NCK)							
Byte	7	6	5	4	3	2	1	0
DBB320	Orientation axis 1							
	Traversing keys							
	+	-	Rapid	Traversing	Feed stop		Activate handwheel	
	-	-	traverse override	key disable			(bit value coding)	
DBB321	Orientation axis 1							
DBB322	OEM signal orientation axis 1							
DBB323	Orientation axis 1							
DBB325	Orientation axis 2							
DBB326	OEM signal orientation axis 2							
DBB327	Orientation axis 2							
DBB328	Orientation axis 3							
	Traversing keys							
	+	-	Rapid	Traversing	Feed stop		Activate handwheel	
	-	-	traverse override	key disable			(bit value coding)	
DBB329	Orientation axis 3							
DBB330	OEM signal orientation axis 3							
DBB331	Orientation axis 3							

Signals from orientation axes

DB21-30	Signals to NCK channel (NCK→PLC)							
Byte	7	6	5	4	3	2	1	0
DBB332	Orientation axis 1							
	Travel command					Handwheel active		
	Plus	Minus				(bit value coding)		
DBB333	Orientation axis 1							
	Active machine function							
			var. INC	10000INC	1000INC	100INC	10INC	1INC
DBB334	OEM signals orientation axis 1							
DBB335	Orientation axis 1							
DBB336	Orientation axis 2							
	Travel command					Handwheel active		
	Plus	Minus				(bit value coding)		
DBB337	Orientation axis 2							
	Active machine function							
			var. INC	10000INC	1000INC	100INC	10INC	1INC
DBB338	OEM signals orientation axis 2							
DBB339	Orientation axis 2							
DBB340	Orientation axis 3							
	Travel command					Handwheel active		
	Plus	Minus				(bit value coding)		
DBB341	Orientation axis 3							
	Active machine function							
			var. INC	10000INC	1000INC	100INC	10INC	1INC
DBB342	OEM signals orientation axis 3							
DBB343	Orientation axis 3							

Tool management functions from NC channel

DB21-30	Signals from NCK channel (NCK→PLC)							
Byte	7	6	5	4	3	2	1	0
Modification signals tool management functions								
DBB344					Last replacement tool of tool group	Transfer to new replacement tool	Tool limit value reached	Tool prewarning limit reached
DBB 345-347								
Transferred tool managgement functions								
DBD348	T number for tool prewarning limit (DInt)							
DBD352	T number for tool limit value (DInt)							
DBD356	T number of new replacement tool (DInt)							
DBD360	T number of last replacement tool							

1.1.9 Signals from/to axis/spindle (PLC→NCK)

(The first axis corresponds to DB31 and the second axis to DB32)

DB31-61	Signals from NCK channel (PLC→NCK)							
Byte	7	6	5	4	3	2	1	0
DBB0 Axis and spindle	Feedrate override /V1/							
	H	G	F	E	D	C	B	A
DBB1 Axis and spindle	Override active /V1/	Position measuring system 2 /A2/	Position measuring system 1 /A2/	Follow-up mode /A2/	Axis/ spindle disable /A2/	Sensor fixed stop /F1/ (SW2 and higher)	Acknowledgement fixed stop reached /F1/ (SW2 and higher)	Drive test movement enable
DBB2 Axis and spindle	Reference point value /R1/				Clamping in progress /A3/	Delete distance-to-go/spindle reset /A2, S1/	Controller enable /A2/	Cam activation /N3/ (SW2 and higher)
	4	3	2	1				
DBB3 Axis and spindle		Velocity/ spindle speed limitation /A3/	Active fixed feed 4 FBMA/, /V1/ (SW4 and higher)	Active fixed feed 3 FBMA/, /V1/ (SW4 and higher)	Active fixed feed 2 FBMA/, /V1/ (SW4 and higher)	Active fixed feed 1 FBMA/, /V1/ (SW4 and higher)	Enable travel tro fixed stop /F1/ (SW4 and higher)	Accept external ZO /K2/ (SW4 and higher)
DBB4 Axis and spindle	Traversing keys /H1/		Rapid traverse override /H1/	Traversing key disable /H1/	Feed stop/ spindle stop /A2/	Activate handwheel /H1/		
	Plus	Minus					2	1
DBB5 Axis and spindle	Machine function /H1/							
			Var. INC	10000INC	1000INC	100INC	10INC	1INC
DBB6 Axis and spindle	OEM axis singals							
DBB7								

DBB8	Request PLC axis/spindle /K5/			Activation signal with change of this byte /5/	Allocate NC axis to channel /K5/			
					D	C	B	A

(Note) DBX8.4: is automatically reset after assignment (SW3.7, 4.2 and higher). For previous SW versions, the activation signal must be applied until the assignment is made (DBB68).

DB31-61	Configuration: Signals to axis/spindle (PLC→NCK)							
Byte	7	6	5	4	3	2	1	0
DBB9					Parameter set Definition from NC disabled	Parameter block servo (SW4 and higher) /K2/		
						C	B	A
DBB 10-11								
DBB12 Axis	Delay reference point approach /R1/				2nd software limit switch /A3/		Hardware limit switch /A3/	
					Plus	Minus	Plus	Minus
DBB 13-15								
DBB16 Spindle	Delete S value /S1/	No n-monitoring when changing gear /S1/	Resynchronize spindle 1 /S1/	Resynchronize spindle 2 /S1/	Gear has changed over /S1/	Actual gear stage /S1/		
						C	B	A
DBB17 Spindle		Invert M3/M4 /S1/	Resynchronize spindle at pos.2 /S1/	Resynchronize spindle at pos.1 /S1/				Feedrate override1f. spindle valid /S1/
DBB18 Spindle	Setpoint rotation direct /S1/		Oscillating speed /S1/	Oscillation via PLC /S1/				
	CCW	CW						
DBB19 Spindle	Spindle override /V1/							
	H	G	F	E	D	C	B	A
DBB20 611D					Speed setpoint smoothing /A2/	Torque limit 2 /A2/	Ramp-function generator interface /A2/	Runup changeover U/f mode /DE1/
DBB21 611D	Pulse enable /A2/	n controller integrator disable /A2/	Selecting motor /A2/	Motor selection /A2/		Drive parameter set selection		
				B	A	C	B	A
DBB22 Safety integration				Speed limit bit value 1	Speed limit bit value 0		Deselect safe standstill	Deselect safe velocity and standstill

DBB23 Safety integration	Activate test stop		Activate end position pair 2			Transmission of bit value 2	Transmission of bit value 1	Transmission of bit value 0
DBB24	Master/ slave on	Reserved for compile cycle					(Stepper motor) Step mode coarse/ fine monitoring	
DBB25								
DBB26 Grinding	Enable emergency retraction			Enable slave axis overlay				
DBB27 Grinding								
DBB28 Oscillation	PLC check axis /P5/ (SW2 and higher)	Stop /P5/ (SW2 and higher)	Stop at next reversal point /P5/ (SW2 and higher)	Change reversal point /P5/ (SW2 and higher)	Set reversal point /P5/ (SW2 and higher)			
DBB29 Grinding				Start gantry synchronization run /G1/ (SW2 and higher)				
DBB 30-31 Grinding								
DBB32 Safety integration				Deselect external stop D	Deselect external stop B	Deselect external stop A		
DBB33 Safety integration	Select override Bit value 3	Bit value 2	Bit value 1	Bit value 0				
DBB34								
DBB..								
DBB59								

(Note) The IS "Delete distance-to-go" (DBX2.2) is effective only for position axes on an axis-specific basis; the IS "Delete distance-to-go" (DB21-30, DB6.2) acts on a channel-specific basis. The IS "Spindle reset" (DXB2.2) acts on a spindle-specific basis.

Signals from axis/spindle

DB31-61	Signals from axis/spindle (NCK→PLC)							
Byte	7	6	5	4	3	2	1	0
DBB60 Axis and spindle	Position reached /B1/ with exact stop fine	with exact stop coarse	Reference/ synchronizes 2 /R1/	Reference/ synchronizes 1 /R1/	Encoder limit frequency exceeded 2 /A3/	Encoder limit frequency exceeded 1 /A3/	NCU_Link Axis active /B3/	Spindle/no axis /S1/
DBB61 Axis and spindle	Current controller active /A2/	Speed controller active /A2/	Position controller active /A2/	Axis/spindle stationary (n<nmin)/A2/	Follow-up mode active /A2/	Axis ready /B3/	Axis container revolution active /B2/	Travel request /F1/
DBB62			Fixed stop reached / F1/ (SW2 and higher)	Activate travel to fixed stop /F1/(SW2 and higher)	Measurement active	Revolutional feedrate active	Handwheel overlay active H1/ (SW2 and higher)	Software cams active / N1/ (SW2 and higher)
DBB63								
DBB64 Axis and spindle	Traverse command /H1/					Handwheel active /H1/		
	Plus	Minus				3	2	1
DBB65 Axis and spindle	Active machine function /H1/							
			Var. INC	10000INC	1000INC	100INC	10INC	1INC
DBB66 Axis and spindle	OEM axis signals (reserved)							
DBB67								
DBB68	PLC axis/ spindle /K5/	Neutral axis/spindle /K5/	Axis replacement possible /K5/	New type requested by PLC /K5/	NC axis/spindle in channel /K5/			
DBB69						Parameter block servo		
						C	B	A
DBB 70-71								
DBB72								
DBB 73-75								

DB31-61	Signals from axis/spindle (NCK→PLC)							
Byte	7	6	5	4	3	2	1	0
DBB76 Axis	Rotary axis in position	Indexing axis in position /T1/	Positioning axis /P2/					Scratch pulse /A2/
DBB77								
DBB78 Axis	F function (REAL format) for positioning axis							
DBB79 Axis	F function (REAL format) for positioning axis							
DBB80 Axis	F function (REAL format) for positioning axis							
DBB81 Axis	F function (REAL format) for positioning axis							
DBB82 Spindle					Gear changeover /S1/	Setpoint gear stage /S1/		
						C	B	A
DBB83 Spindle	Actual rotat. direction CW /S1/	Speed monitoring /W1/ (SW2 and higher)	Spindle in setpoint position /S1/	Support area limits violated /S8/ (SW2 and higher)	Geometry monitoring /W1/ (SW2 and higher)	Set speed increased /S1/	Set speed increased /S1/	Speed limit exceeded /S1/
DBB84 Spindle	Active spindle operating mode./S1/			Synchronous mode /S3/ (SW2 and higher)	Tapping without compensating chuck /S1/	CLGON active /S8/ (SW2 and higher)	SUG active (grinding wheel surface speed) /S8/ (SW2 and higher)	Constant cutting speed active
	Control mode	Control mode	Positioning mode					
DBB85 Spindle								
DBB86 Spindle	M function (binary) for spindle /S1/							
DBB88 Spindle	S function (floating-point) for spindle /S1/							
DBB89	S function (floating-point) for spindle /S1/							
DBB90	S function (floating-point) for spindle /S1/							

DBB91	S function (floating-point) for spindle /S1/							
DBB92 611D					Speed setpoint smoothing active /A2/	Torque limit 2 active /A2/	HLGSS active /A2/	Set-up mode active /A2/
DBB93 611D	Enable pulses /A3/	n controller integrator disabled /A2/	Drive ready /A2/	Active motor /A2/		Active drive parameter set /A2/		
				B	A	C	B	A
DBB94 611D	Variable signaling function /A2/	|nact|=nset /A2/	|nact|<nx /A2/	|nact|<nmin /A2/	Md<Mdx /A2/	Ramp-up complete /A2/	Temperature pre-warming /A2/ Heat sink	Motor
DBB95 611D								UDC-link alarm threshold /A2/
DBB96	Master/ slave active /TE3/	Reserved for compile cycle						(Stepper motor) error rotation monitoring /S6/
DBB97								
DBB98 Synchronous spindle	Emergency retraction active	Acceleration warning threshold reached	Speed warning threshold reached	Overlaid motion /S3/ (SW2 and higher)		Actual value coupling /S3/ (SW2 and higher)	Synchronism (SW2 and higher) /S3/	
							coarse	fine
DBB99 Synchronous spindle	Emergency retraction enabled	Max. acceleration reached	Max. speed reached	Synchronization running	Axis accelerating		Slave spindle active (SW2 and higher) /S3/	Master spindle active (SW2 and higher) /S3/
DBB100 Grinding (SW2 and higher)	Oscillation active /P5/	Oscillation motion active /P5/	Spark-out active /P5/	Error in oscillation /P5/	Oscillation cannot start /P5/			
DBB101 Gantry (SW2 and higher)	Gantry axis /G1/	Gantry leading axis /G1/	Gantry grouping issynchronous G1/	Gantry synchronization run ready to start /G1/	Gantry warning limit exceeded /G1/	Gantry cutting-off limit exceeded /G1/		
DBB 102,103								
DBB104 Grinding (SW2 and higher)	Active infeed axis /P5/							
	Axis 8	Axis 7	Axis 6	Axis 5	Axis 4	Axis 3	Axis 2	Axis 1

DB31-61	Configuration: Signals from axis/spindle (NCK→PLC)							
Byte	7	6	5	4	3	2	1	0
DBB105	Active infeed axis /P5/							
	16	15	14	13	12	11	10	9
DBB106	Active infeed axis /P5/							
	24	23	22	21	20	19	18	17
DBB107	Active infeed axis /P5/							
		31	30	29	28	27	26	25
DBB108	Safety integrated							
	Axis safely referenced					Delete pulses via external circuit		Safe speed or zero speed active
DBB109	Safety integrated Actual position > cam position							
	SC4-	SC4+	SC3-	SC3+	SC2-	SC2+	SC1-	SC1+
DBB110	Safety integrated							
			n<nx	Safe velocity active bit value 1	Safe velocity active bit value 0		Safe zero speed active	
DBB111	Reserved for safety integrated							
	Stop E active	Stop D active	Stop C active	Stop A/B active				

1.1.10 Interface for loading/unloading magazine

DB71	Interface for loading/unloading magazine (NCK→PLC)							
Byte	7	6	5	4	3	2	1	0
DBB0	Interface (I) active							
	I8	I7	I6	I5	I4	I3	I2	I1
DBB1	Interface (I) active							
	I16	I15	I14	I13	I12	I11	I10	I9
DBB2,3								
DBB n	res.	res.	res.	res.	Position at loading point	Reload	Unload	Load
DBB n+2	Assigned channel (8 bit Int)							
DBB n+3	Tool management no. (8 bit Int)							
DBD n+4	Unassigned parameter 1 (D word)							
DBD n+8	Unassigned parameter 2 (D word)							
DBD n+12	Unassigned parameter 3 (D word)							
DBW n+16	Identification for loading/unloading station (Int), (fixed value 9999)							
DBW n+18	No. of loading station (int)							
DBW n+20	Magazine no. (source) for unloading/reloading (int)							
DBW n+22	Location no. (source) for unloading/reloading (int)							
DBW n+24	Magazine no. (target) for loading/reloading/positioning (Int)							
DBW n+26	Location no. (target) for loading/reloading/positioning (Int)							
DBW n+28	Spare							

Initial addresses of the loading/unloading stations:

Loading/unloading station 1: n=4

Loading/unloading station 2: n=34

Loading/unloading station 3: n=64

Loading/unloading station 4: n=94

Load interface 1 is responsible for spindle loading and reloading of tools. It is also used for “asynchronous transfer” function. (FC8)

1.1.11 Interface for spindle as change position

DB72	Signals from spindle (NCK→PLC)							
Byte	7	6	5	4	3	2	1	0
DBB0	Interface (I) active							
	I8	I7	I6	I5	I4	I3	I2	I1
DBB1	Interface (I) active							
	I16	I15	I14	I13	I12	I11	I10	I9
DBB2,3								
DBB n	res.	res.	res.	res.	res.	Prepare change	Perform change (initiate: M06)	Compulsory change
DBB n+1	Unassigned							
DBB n+2	Assigned channel no. (8 bit Int)							
DBB n+3	Tool management no. (8 bit Int)							
DBD n+4	Unassigned parameter 1 (D word)							
DBD n+8	Unassigned parameter 2 (D word)							
DBD n+12	Unassigned parameter 3 (D word)							
DBW n+16	Buffer identification (Int), (fixed value 9998) (corresponds to “Target position for new tool”)							
DBW n+18	Relative location (target) in the buffer (int)							
DBW n+20	Magazine no. (source) for new tool (Int)							
DBW n+22	Location no. (source) for new tool							
DBW n+24	Magazine no. (target) for new tool							
DBW n+26	Location no. (target) for old tool (Int)							
DBW n+28	Tool new: location type (Int)							
DBW n+30	Tool new: size left (Int)							
DBW n+32	Tool new: size right (Int)							
DBW n+34	Tool new: size top (Int)							
DBW n+36	Tool new: size bottom (Int)							
DBB n+38	Tool status for tool new							
		Tool was in use	Tool fixed location coded	Pre-warning limit reached	Tool measured	Tool disabled	Tool enabled	Active tool
DBWn+40	Tool new: T no. (Int)							
DBWn+42	Spare							
DBWn+44	Spare							
DBWn+46	Spare							
Initial addresses of the buffers: Spindle 1: n=4, Spindle 2: n=52								

1.1.12 Interface for circular magazine

DB73	Signals from circular magazine (NCK→PLC)							
Byte	7	6	5	4	3	2	1	0
DBB0	Interface (I) active							
	I8	I7	I6	I5	I4	I3	I2	I1
DBB1	Interface (I) active							
	I16	I15	I14	I13	I12	I11	I10	I9
DBB2,3								
DBB n	res.	res.	res.	res.	res.	res.	Perform change (initiate: T no.)	Compulsory change
DBB n+1	Unassigned							
DBB n+2	Assigned channel no. (8 bit Int)							
DBB n+3	Tool management no. (8 bit Int)							
DBD n+4	Unassigned parameter 1 (D word)							
DBD n+8	Unassigned parameter 2 (D word)							
DBD n+12	Unassigned parameter 3 (D word)							
DBW n+16	Reserved							
DBW n+18	Reserved							
DBW n+20	Circular magazine no. (Int)							
DBW n+22	Location no. for new tool (Int)							
DBW n+24	Reserved							
DBW n+26	Location no. for old tool (Int)							
DBW n+28	Tool new: location type (Int)							
DBW n+30	Tool new: size left (Int)							
DBW n+32	Tool new: size right (Int)							
DBW n+34	Tool new: size top (Int)							
DBW n+36	Tool new: size bottom (Int)							
DBB n+38	Tool status for tool new							
		Tool was in use	Tool fixed location coded	Pre-warning limit reached	Tool measured	Tool disabled	Tool enabled	Active tool
DBW n+40	Tool new: T no. (Int)							
DBW n+42	Spare							
Initial addresses of the circular magazine: Circular magazine 1: n=4, Circular magazine 2: n=48								

1.1.13 Interface for buffer (tool management)

DB77	Buffer (tool management)							
Byte	7	6	5	4	3	2	1	0
DBB n+0							Data not complete	Buffer occupied (ZWS)
DBB n+1								Request ZWS data
DBW n+2	Magazine no. of old location (Int)							
DBW n+4	Location no. of old location (Int)							
DBW n+6	Tool: Location type (Int)							
DBW n+8	Tool: size left (Int)							
DBW n+10	Tool: size right (Int)							
DBW n+12	Tool: size top (Int)							
DBW n+14	Tool: size bottom (Int)							
DBB n+16	Tool status							
		Tool was in use	Tool fixed location coded	Pre-warning limit reached	Tool measured	Tool disabled	Tool enabled	Active tool
DBB n+17	Tool status							
DBB n+18	Tool: T no. (Int)							
DBW n+42	Spare							
Initial addresses of the buffers: Buffer 1: n=0, Buffer 2: n=20, Buffer 3: n=40, m: n=(m-1)*20								

1.2 HMI/PLC Interface Signals

DB90	PLC to HMI Signal							
DBB	#7	#6	#5	#4	#3	#2	#1	#0
0	DCLP Door Close	DOPP Door Open					DRNP Dry Run	MLKP Machine Lock
1	WLTP Lighting ON	ASPP Air in Spindle ON	ACKP Air Chuck ON	SHGP Spindle High Speed	SMDP Spindle Middle Speed	SLWP Spindle Low Speed	CACP C-axis Couple	RTCP Rotary Tool Couple
2	KEY Memory Write	PSTP Program Stopping	DGCN Digital Setting Center	DGCK Digital Setting Chuck	RSTK Reset Key ON		DRHP Dry Run Prohibit	MLHP Machine Lock Prohibit
3	TSBE Tail Stock Retreat End	HNDL Handle Mode		BDGK Back Digital Setting Chuck		CH2 Channel 2 Select	CH1 Channel 1 Select	EDIT Editing Mode
4		BASP Back Air in Spindle ON	BACP Back Air Chuck ON	BSHP Back Spindle High Speed	BSMP Back Spindle Middle Speed	BSLP Back Spindle Low Speed	BCAP Back C-axis Couple	BRTP Back Rotary Tool Couple
5	STBY Operation ready	PGCK Now checking program						DMYST Dummy Start
6								QSET Q-setter Mode
7		TPUD Turret unclamp state	TPCD Turret clamp state	EASOP Machine Operation Enable	ECCTC Chip Conveyor OFF Count			

DB91	HMI to PLC Signal							
DBB	#7	#6	#5	#4	#3	#2	#1	#0
0	DCLM Door Close	DOPM Door Open	ATPM Auto Power Shutoff	CPKM Chip Conveyor	PRSM Program Restart	BRSM Block Restart	DRNM Dry Run	MLKM Machine Lock
1	WLTM Lighting	ASPM Air in Spindle	ACKM Air Chuck	SHGM Spindle High Speed	SMDM Spindle Middle Speed	SLWM Spindle Low Speed	CACM C-axis Couple	RTCM Rotary Tool Couple
2	CKEM Chuck External Clamp							
3	BDT8 Block Skip 8	BDT7 Block Skip 7	BDT6 Block Skip 6	BDT5 Block Skip 5	BDT4 Block Skip 4	BDT3 Block Skip 3	BDT2 Block Skip 2	
4	BCKM Back Chuck External Clamp	BASM Back Air in Spindle	BACM Back Air Chuck	BSHM Back Spindle High Speed	BSMM Back Spindle Middle Speed	BSLM Back Spindle Low Speed	BCAM Back C-axis Couple	BRTM Back Rotary Tool Couple
5	LJCM Soft Jaw Machining Start Complete	LJGR Soft Jaw Machining Checking	PCGR Pre-ma-chining Graphic Mode	STDS Start Disable	STRQ Start Request	DMYFN Dummy Start-up Comple-ted	QRSP Repeat Measure-ment Suspend	QRST Repeat Measure-ment Start
6						R-AFL Aux. Function Lock Return	R-DRN Dry Run Return	R-MLK Machine Lock Return
7	HMIST HMI Start Complete	SLMD Stroke Limit Changed	TPUC Turret Unclamp	TPCL Turret Clamp	ECCTU Conveyor Countup			
8								TPAX Turret Axes Selected

DB92	PLC/HMI Signal (Related to LS/SOL Diagram)							
DBB	#7	#6	#5	#4	#3	#2	#1	#0
0	Picture							
	7	6	5	4	3	2	1	0
1	Picture							
	15	14	13	12	11	10	9	8
2	Picture							
	23	22	21	20	19	18	17	16
3	Picture							
	31	30	29	28	27	26	25	24
4	Picture							
	39	38	37	36	35	34	33	32
5	Picture							
	47	46	45	44	43	42	41	40
6	Picture							
	55	54	53	52	51	50	49	48
7	Picture							
	63	62	61	60	59	58	57	56
8	Picture							
	71	70	69	68	67	66	65	64
9	Picture							
	79	78	77	76	75	74	73	72
10	Picture							
	87	86	85	84	83	82	81	80
11	Picture							
	95	94	93	92	91	90	89	88
12	Picture							
	103	102	101	100	99	98	97	96
13	Picture							
	111	110	109	108	107	106	105	104
14	Picture							
	119	118	117	116	115	114	113	112
15	Picture							
	127	126	125	124	123	112	121	120
16	Picture							
	135	134	133	132	131	130	129	128
17	Picture							
	143	142	141	140	139	138	137	136
18	Picture							
	151	150	149	148	147	146	145	144
19	Picture							
	159	158	157	156	155	154	153	152

DB92	PLC/HMI Signal (Related to LS/SOL Diagram)							
DBB	#7	#6	#5	#4	#3	#2	#1	#0
20	Picture							
	167	166	165	164	163	162	161	160
21	Picture							
	175	174	173	172	171	170	169	168
22	Picture							
	183	182	181	180	179	178	177	176
23	Picture							
	191	190	189	188	187	186	185	184
24	Picture							
	199	198	197	196	195	194	193	192
25	Picture							
	207	206	205	204	203	202	201	200
26	Picture							
	215	214	213	212	211	210	209	208
27	Picture							
	223	222	221	220	219	218	217	216
28	Picture							
	231	230	229	228	227	226	225	224
29	Picture							
	239	238	237	236	235	234	233	232
30	Picture							
	247	246	245	244	243	242	241	240
31	Picture							
	255	254	253	252	251	250	249	248
32	Picture2							
	7	6	5	4	3	2	1	0
33	Picture2							
	15	14	13	12	11	10	9	8
34	Picture							
	23	22	21	20	19	18	17	16
35	Picture2							
	31	30	29	28	27	26	25	24
36	Picture2							
	39	38	37	36	35	34	33	32
37	Picture2							
	47	46	45	44	43	42	41	40
38	Picture2							
	55	54	53	52	51	50	49	48
39	Picture2							
	63	62	61	60	59	58	57	56

DB92	PLC/HMI Signal (Related to LS/SOL Diagram)							
DBB	#7	#6	#5	#4	#3	#2	#1	#0
40	Picture2							
	71	70	69	68	67	66	65	64
41	Picture2							
	79	78	77	76	75	74	73	72
42	Picture2							
	87	86	85	84	83	82	81	80
43	Picture2							
	95	94	93	92	91	90	89	88
44	Picture2							
	103	102	101	100	99	98	97	96
45	Picture2							
	111	110	109	108	107	106	105	104
46	Picture2							
	119	118	117	116	115	114	113	112
47	Picture2							
	127	126	125	124	123	122	121	120
48	Picture2							
	135	134	133	132	131	130	129	128
49	Picture2							
	143	142	141	140	139	138	137	136
50	Picture2							
	151	150	149	148	147	146	145	144
51	Picture2							
	159	158	157	156	155	154	153	152

DB92	PLC/HMI Signal (Related to LS/SOL Diagram)							
DBB	#7	#6	#5	#4	#3	#2	#1	#0
52	Picture2							
	167	166	165	164	163	162	161	160
53	Picture2							
	175	174	173	172	171	170	169	168
54	Picture2							
	183	182	181	180	179	178	177	176
55	Picture2							
	191	190	189	188	187	186	185	184
56	Picture2							
	199	198	197	196	195	194	193	192
57	Picture2							
	207	206	205	204	203	202	201	200
58	Picture2							
	215	214	213	212	211	210	209	208
59	Picture2							
	223	222	221	220	219	218	217	216
60	Picture2							
	231	230	229	228	227	226	225	224
61	Picture2							
	239	238	237	236	235	234	233	232
62	Picture2							
	247	246	245	244	243	242	241	240
63	Picture2							
	255	254	253	252	251	250	249	248

DB94	PLC to HMI Signal (Axis Type)							
DBB	#7	#6	#5	#4	#3	#2	#1	#0
0	RPMD8 Origin MD Setting							
	8	7	6	5	4	3	2	1
1	RPMD16 Origin MD Setting							
	16	15	14	13	12	11	10	9
2	RPFN8 Origin Processing Complete							
	8	7	6	5	4	3	2	1
3	RPFN16 Origin Processing Complete							
	16	15	14	13	12	11	10	9

DB95	HMI to PLC Signal (Axis Type)							
DBB	#7	#6	#5	#4	#3	#2	#1	#0
0	RPEF8 Origin Setting Enable							
	8	7	6	5	4	3	2	1
1	RPEF16 Origin Setting Enable							
	16	15	14	13	12	11	10	9
2	MDFN8 MD Setting Complete							
	8	7	6	5	4	3	2	1
3	MDFN16 MD Setting Complete							
	16	15	14	13	12	11	10	9
4	RPAL8 Origin Setting Alarm							
	8	7	6	5	4	3	2	1
5	RPAL16 Origin Setting Alarm							
	16	15	14	13	12	11	10	9

V. APPENDIXES

1. NCK SOFTWARE REPLACEMENT PROCEDURE

1.1 Introduction

This manual describes how to upgrade an NCK system version and back up/restore an archive, both of which are required for system replacement.

1.2 Preparations

Prepare the following:

Installation Procedure Manual
PC (with Ethernet; 100-MB Ethernet card if possible, or 10-MB if not available)
Ethernet cross cables
NCK binary file (nckpcnc.exe, pcnc.abb)

1.3 Upgrading the NCK System Version

The version upgrading method described below applies only to when upgrading the NCK. If upgraded with a GHOST image, this procedure will not be required because the NCK will be also updated. This procedure is described in such a manner to copy a file alone.

1.3.1 Preparing for Backup

Prior to upgrading, back up the NC related data. First, prepare for backup.

① Set an access level.
Set a password for services in the Set Password Menu of the [Start-up] Menu.
Enter "***."

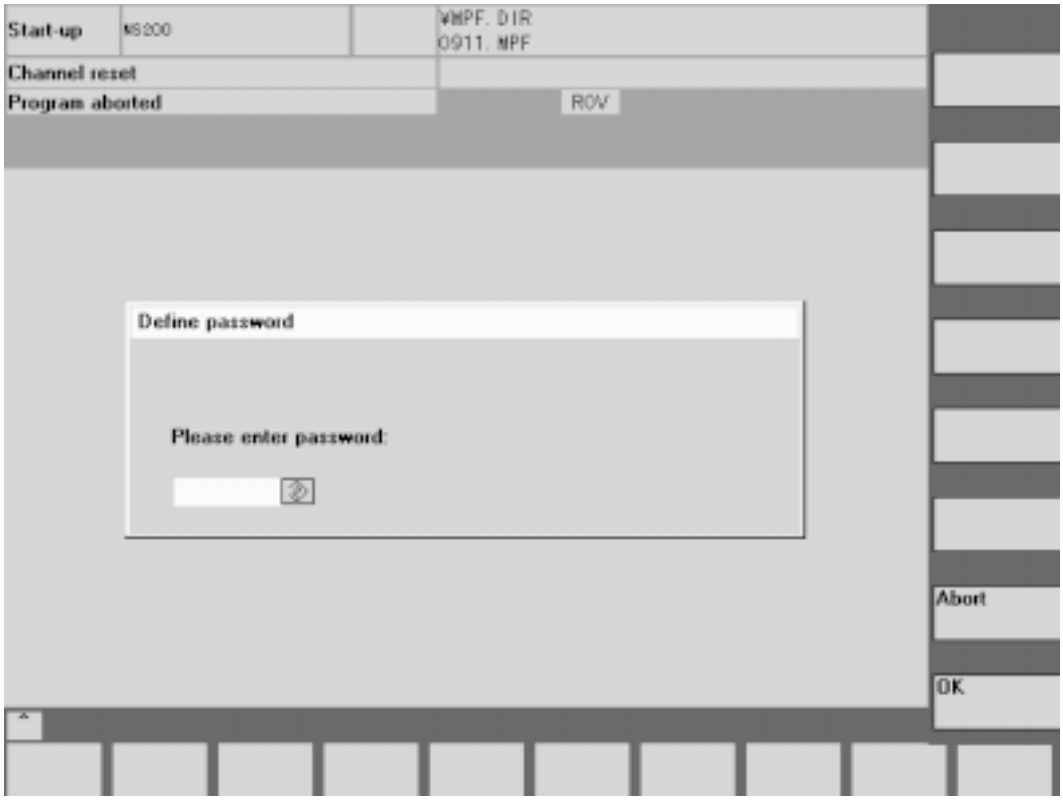


Fig. 1.3.1 Password Screen

1.3.2 Backing up the Data

Create an archive file, selecting [Batch Setup] in the back menu of the [Service] function and individually checking in the NC and PLC check boxes.

① For the NC, back up the data in the following procedure.

② Select only NC in the [Service] - Back Menu - [Batch Setup] function screen.

③ For the NC, check in the box for "Compensation Data Included" to back up.

④ After entering an archive file name, press the [Archive] key on the right to start creating the archive file. These files are saved in the F:\dh\arc.dir folder under the specified file name.

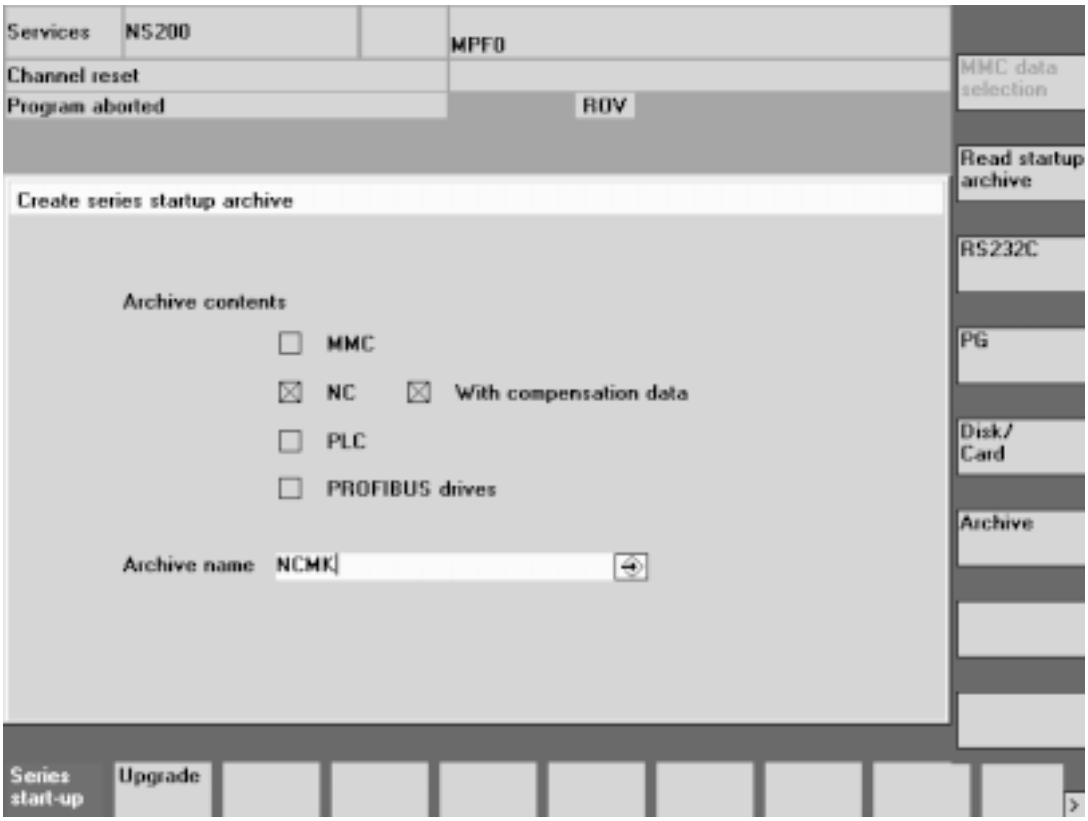


Fig. 1.3.2(a) Archive Screen

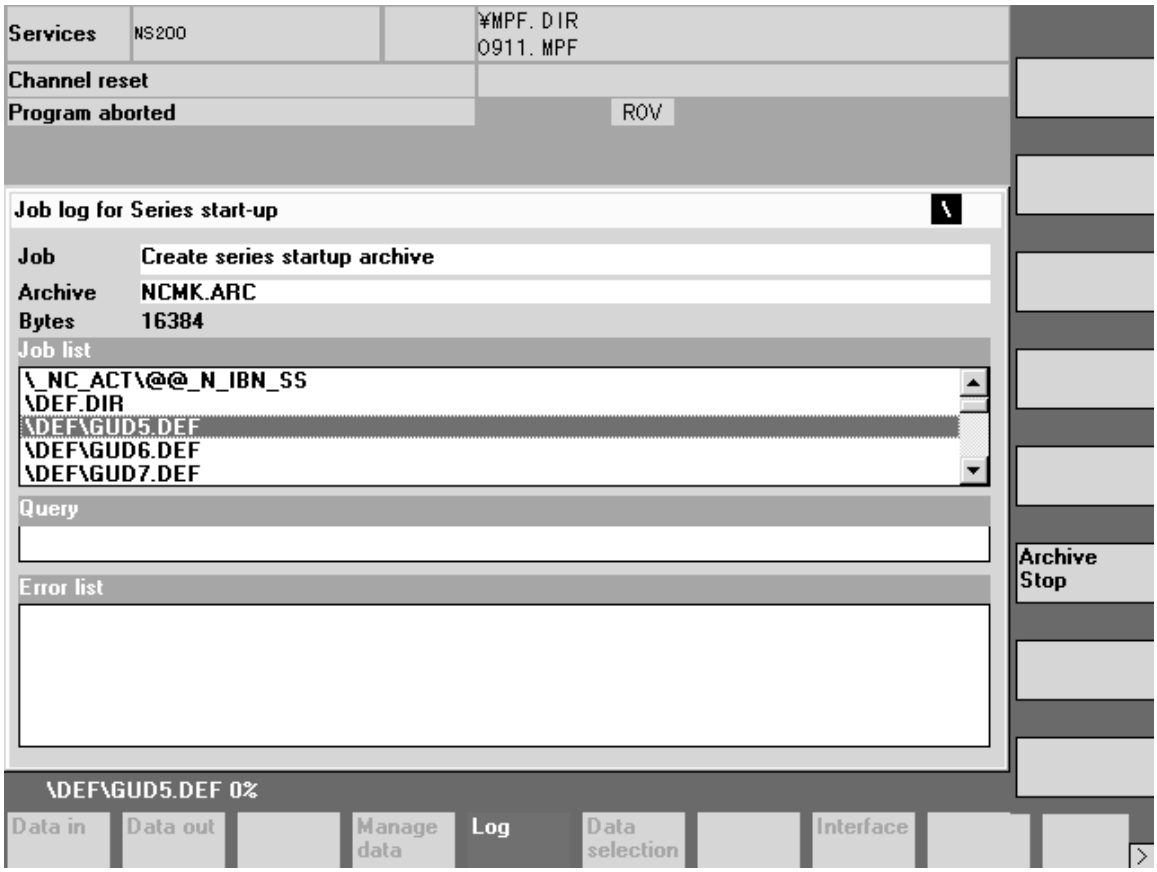


Fig. 1.3.2(b) Setup Screen

⑤ Back up the PLC as well.
For the PLC, the execution ladder related data is backed up with the archive.

⑥ Terminate the MMC.

⑦ Restart to switch to the Windows NT's mode. Select the Service menu and restart 840Di. After BIOS is started, the following Boot menu is displayed.
[Sinumerik] ---- Normal
The Service menu can be started by pressing the cursor down key and INPUT key when the Boot menu is being displayed. (The cursor moves to the blank below [Sinumerik]. Note that you have only 2 seconds to select in the Boot menu.

⑧ Selecting Start Windows NT
Select No. 4 [Start Windows NT (Service Mode)] in the menu.

⑨ Selecting Standard Windows NT
Select No. 1 [Standard Windows NT (Without starting SINUMERIK HMI)] in the menu.

⑩ Inputting the password
The NC will be rebooted and ask you for the password. Enter "***" and press the INPUT key.

⑪ Windows NT Desktop
The Windows NT desktop will be displayed. Set a network and connect to an external PC. For details, see 1.4.

1.3.3 Stopping LogB Service

Open Service for Control Panel.

Select LogB Service and press the "STOP" button. This will stop an NCK application.

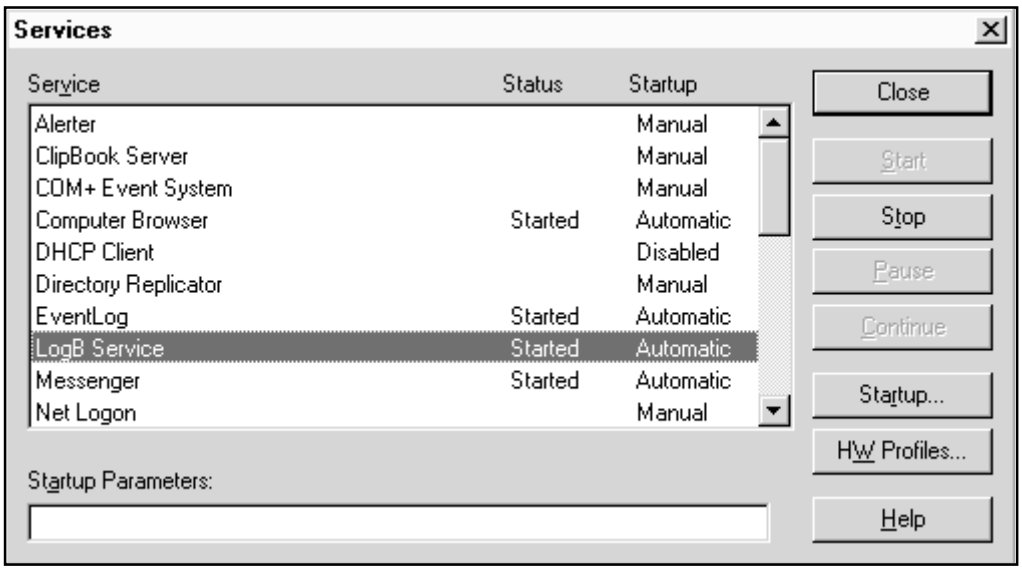


Fig.1.3.3 Windows Service Screen

1.3.4 Copying the NCK Binary File

Copy the NCK binary files nckpcnc.exe and pcnc.abb into the following directory.

F:\Siemens\Sinumerik\sin840di\bin

1.3.5 Restarting LogB Service

Select LogB Service and press the "Start" button. This will enable an NCK application.

1.3.6 Generating the NC and PLC

Generate the NC and PLC in the following manner.

① Double-click the "840Di-Startup" icon for the desktop.

Fig. 1.3.6(a) SINUMERIK 840DI-Startup Screen

② Once the application is started up, go to Window, Diagnosis, and NC/PLC in that order, then, onto the Generation screen.
③ Press "STOP" in the PLC window to stop the PLC.
④ Press "MRES" in the PLC window to initialize the PLC.
⑤ Press "Clear NC memory" in the NC window to initialize the NC.
⑥ Press "NC-Reset" in the NC window to reset. Confirm that only the RUN signal for the PLC blinks in green.
⑦ Close 840Di-Startup.

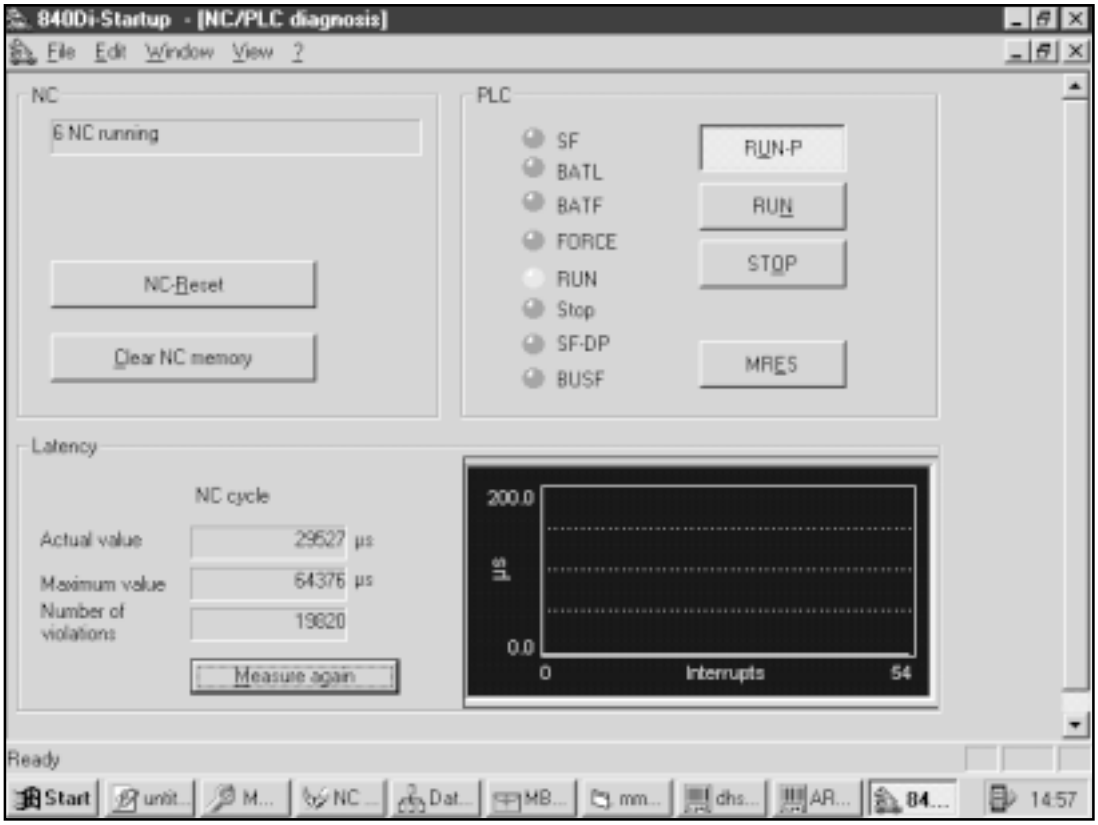


Fig. 1.3.6(b) NC/PLC Diagnosis Screen

1.3.7 Starting up the MMC

In order to start up the MMC, double-click "HMI-startup."

1.3.8 Setting the Password

Start up the MMC screen and set the password with [Start-up] in the Y-screen.

1.3.9 Confirming the NCK Software Version

Confirm the NCK software version in the [Version] screen under [Service Display] of the [Diagnosis] function.

1.3.10 Restoring the Backup

The following describes how to restore the archive backed up in the data backup procedure.

① Restoring the PLC dummy archive

As with the data backup procedure, press the [Read Archive] key on the right of the [Batch Setup] screen in the [Service] back menu. Select PLC•QDUMM.ARC and press the Start key. As you will be asked if you really want to restore, press the [Yes] vertical function. This file is dummy, but necessary work for establishing a basic configuration for ProfiBus.

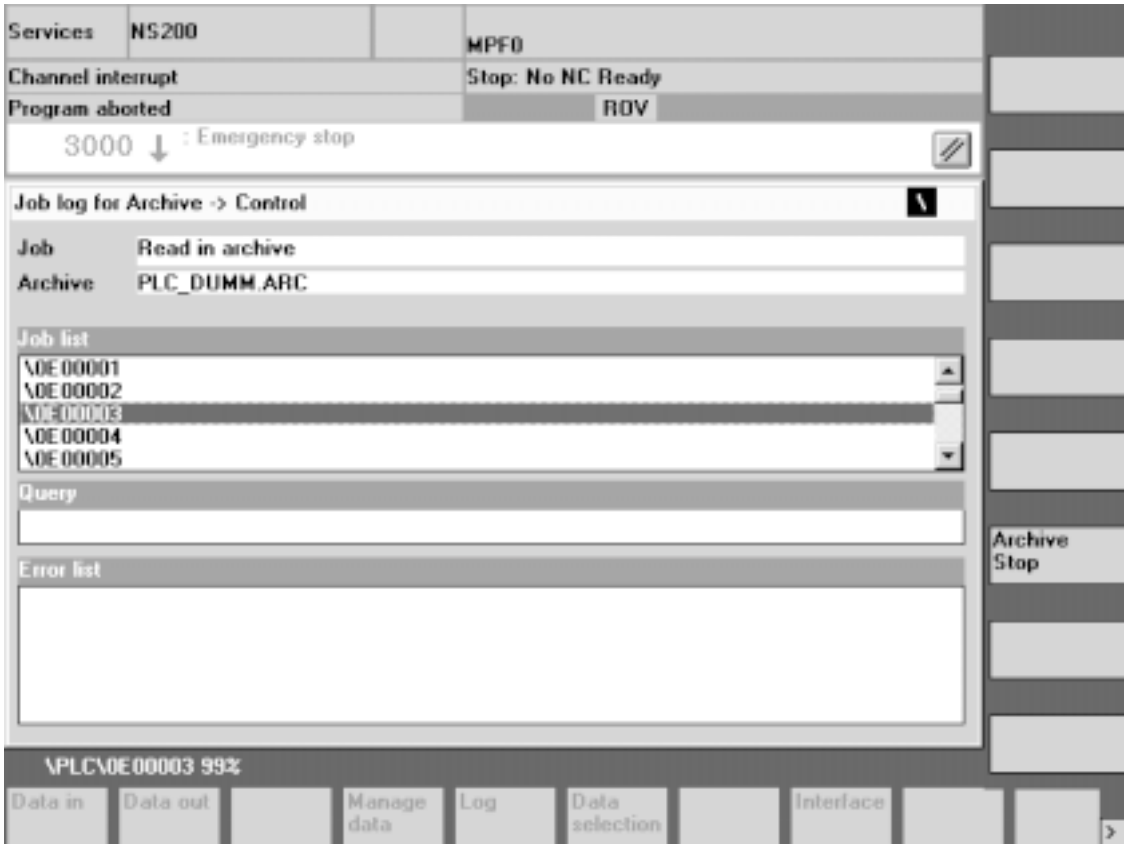


Fig. 1.3.10 Restore Archive Screen

② Restoring the NC archive

Restore the backed up NC archive in the same procedure as the above-mentioned.

③ Restoring the PLC archive

Restore the backed up PLC archive in the same procedure as the above-mentioned.

1.3.11 Confirming the Software Version

Confirm the software version in the [Version] screen under [Service Display] of the [Diagnosis] function.

1.3.12 Restarting the Power

Now, you are finished with upgrading the NCK system. Terminate the HMI and shut down the NT. Deactivate the main circuit breaker once, and then, activate it again. Start up the HMI manually from the HMI startup icon and confirm that all the screens are functioning properly.

1.3.13 Deleting the Password

Delete the password in the Start-up screen.

1.4 Connecting to the Network

The following describes an example of connecting between the 840Di and PC.

• Items Required

Cross cables (10BASE-T)

PC (100-M Ethernet if possible)

This machine

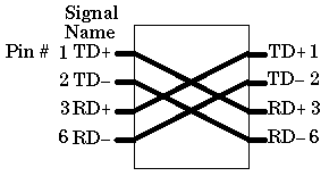


Fig. 1.4(a) Cross Cables

① Select Network in 840Di Control Panel to open TCP/IP Properties.

② Set the 840Di's IP address to 192.168.1.1 and subnet mask to 255.255.255.0.

③ Set the PC's IP address to 192.168.1.2 and subnet mask to 255.255.255.0.

④ Restart up the 840Di and PC to connect them one to one with cross cables.

⑤ Set the PC drive to Shared.

⑥ Start up Explorer at the 840Di and search for the PC's computer name to capture necessary data from the shared drive.

Fig. 1.4(b) TCP/IP Properties

Caution: Upon shipment of the 840Di, be sure to erase the set IP address.

Supplement 1: To confirm whether communications are properly done, open a DOS prompt to ping the other party's IP address.

840Di DOS prompt: ping 192.168.1.2

Supplement 2: When accessing from the external PC to the NC, use the user name auduser and password SUNRISE.

Supplement 3: You can also connect with NetBEUI. If this is the case, it is unnecessary to set the IP address.

2. PLC (LADDER) SOFTWARE REPLACEMENT PROCEDURE

2.1 Installing the PLC (Ladder) Software

(The following describes an example of not using a mouse.)

① In the System screen, bring the cursor to "30.Y Menu" and press INPUT. After displaying the Y-screen, press the MENU SELECT key of the operation panel, followed by the > key to assign Step 7 to one of the function keys.

② Press the Step 7 function key. The SIMATIC Manager screen will be started up.

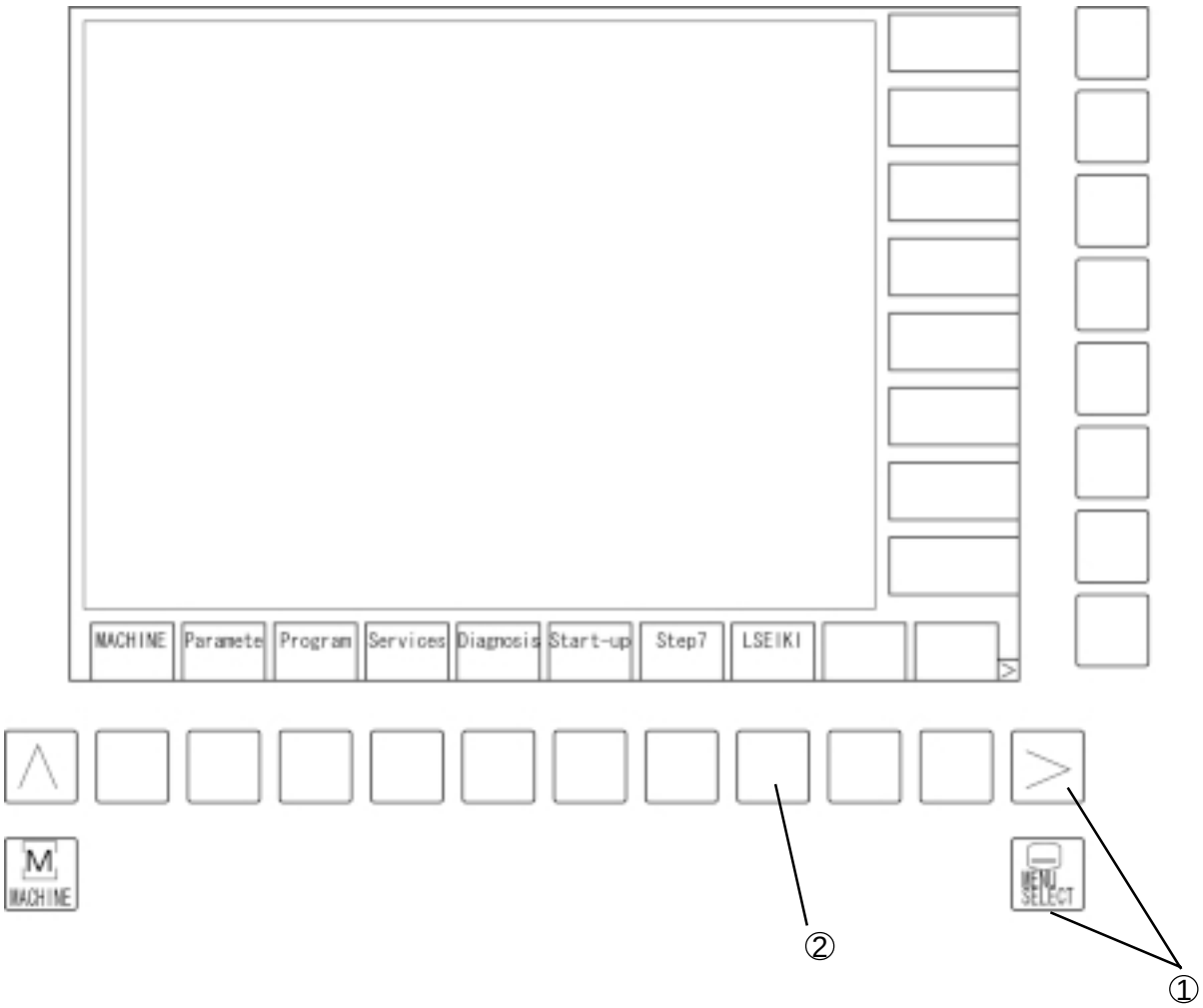


Fig. 2.1(a) Y-screen

③ Press the Alt key, followed by the F key to open File's submenu. Using the cursor keys ↑ and ↓, move the cursor to Retrieve in the submenu and press the INPUT key.

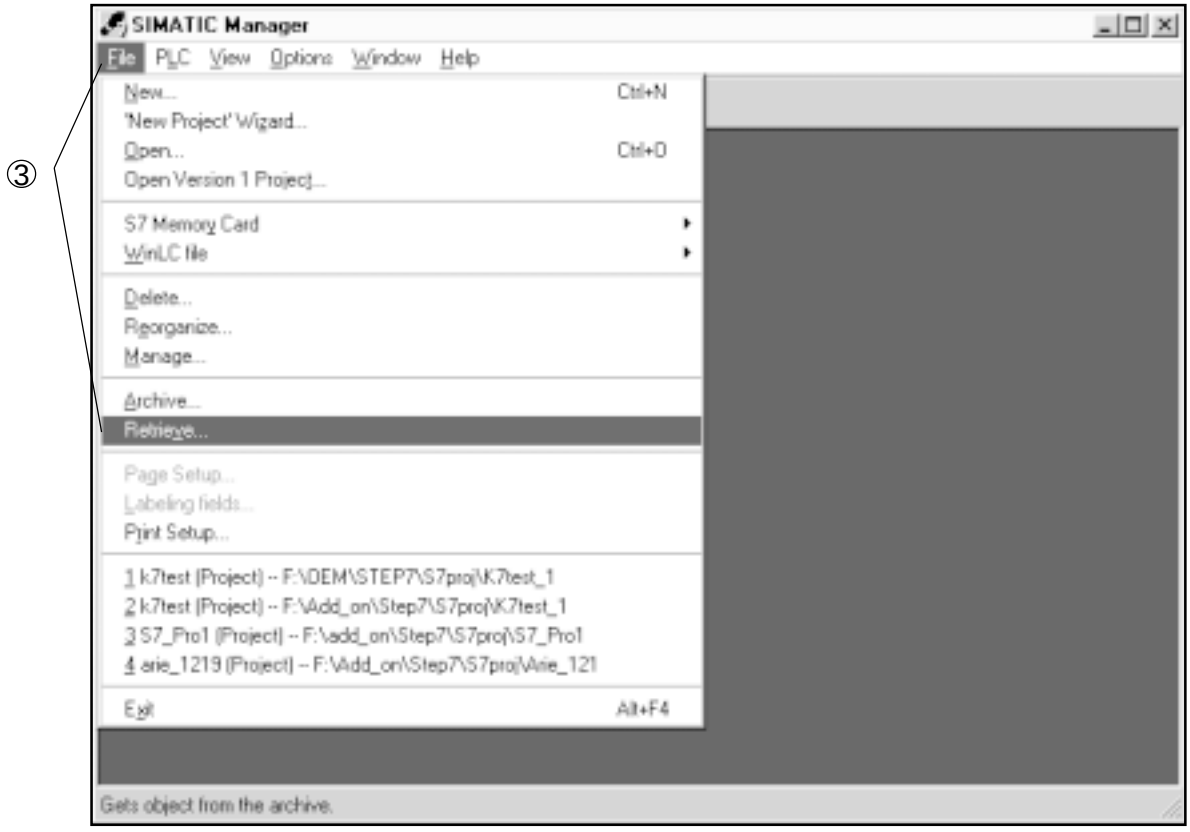


Fig. 2.1(b) SIMATIC Manager Screen

④ Using the TAB key and ↑ and ↓ keys, move the cursor to an archive file (K7test _1.arj in the example) and press the INPUT key.

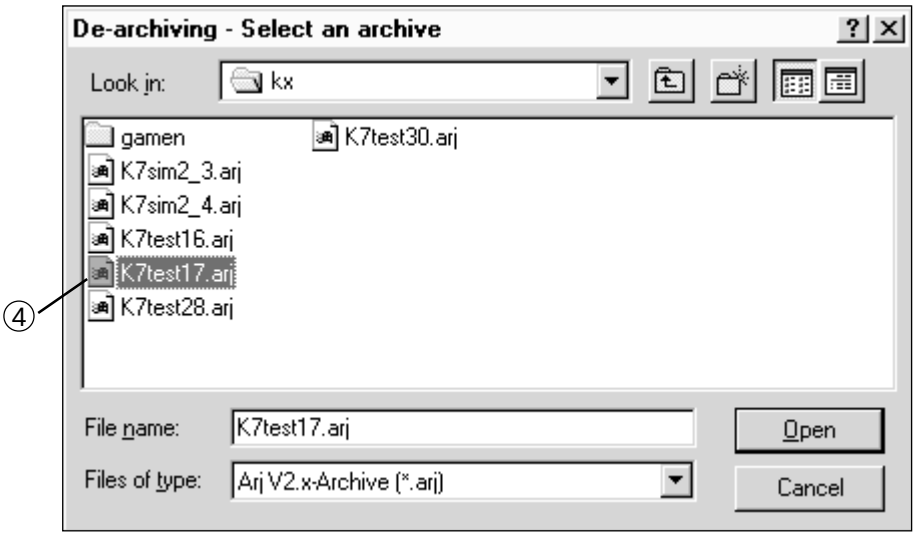


Fig. 2.1(c) Retrieve Screen

⑤ Using the TAB key and ↑ and ↓ keys, move the cursor to an installation directory (S7proj in the example) and press the INPUT key.

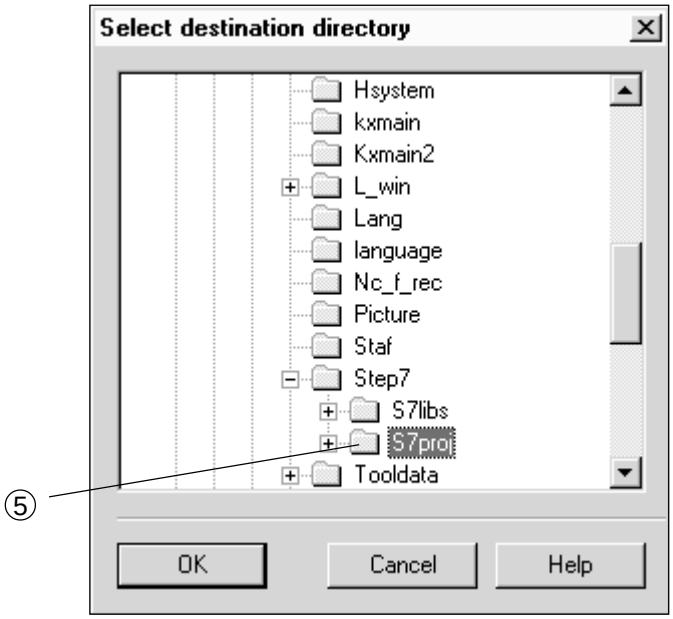


Fig. 2.1(d) Target Directory Screen

⑥ The archive thawing screen is displayed.

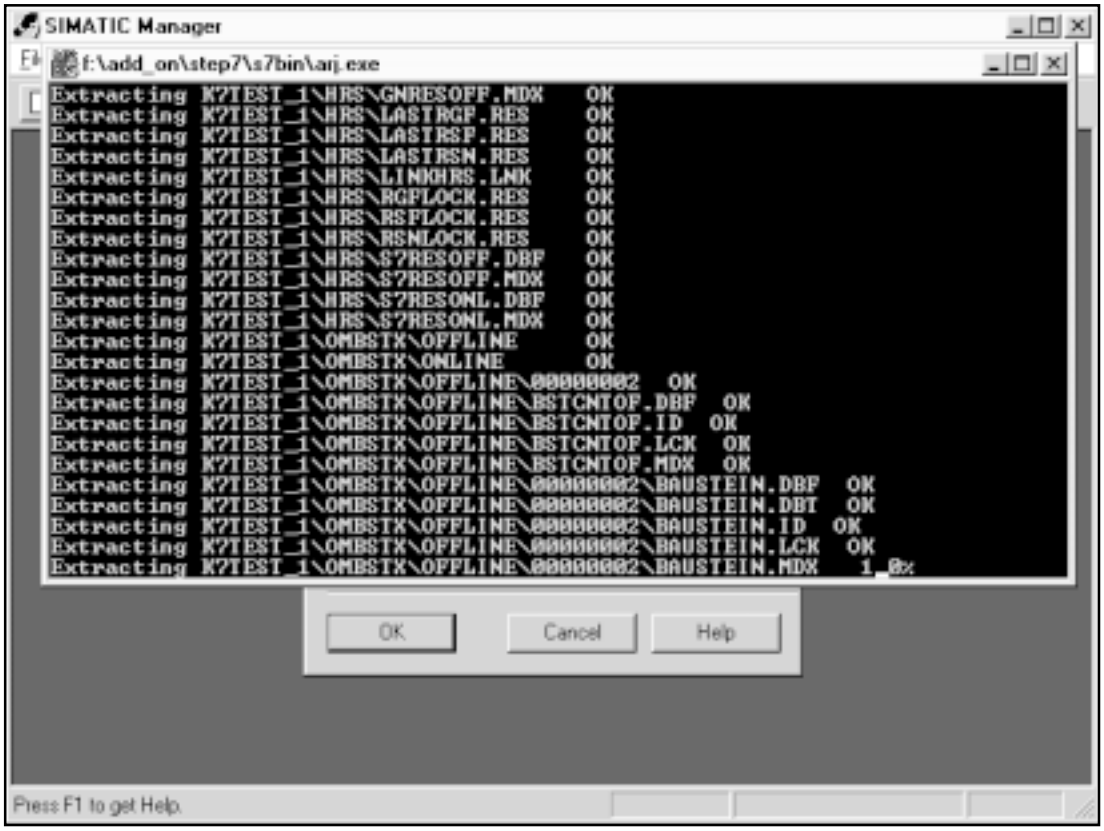


Fig. 2.1(f) Archive Thawing Screen

⑦ A message, "Directory already exists," appears. Use the TAB key to move the cursor to Replace, and press the INPUT key.

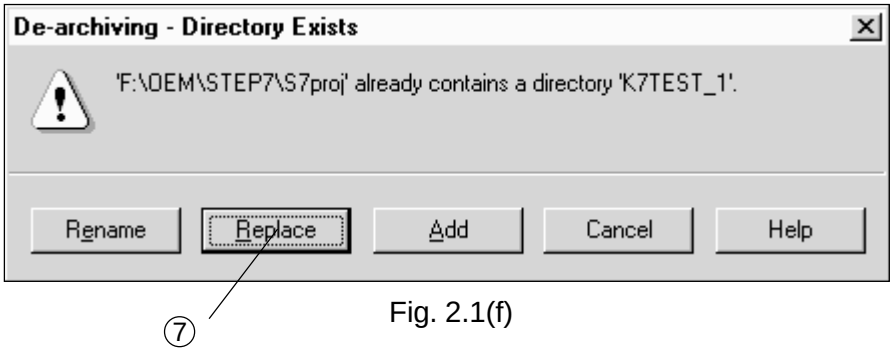


Fig. 2.1(f)

⑧ A message, "Do you want to open the object now?" appears. Move the cursor to Yes with the TAB key and press the INPUT key.

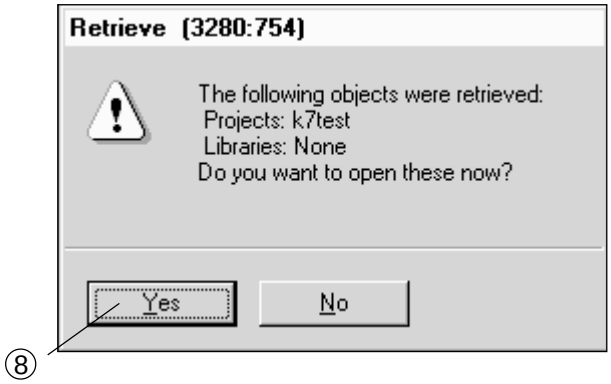


Fig. 2.1(g)

2.2 Downloading the PLC (Ladder)

① Using the cursor key [→], scroll up the tree shown in the screen. Upon reaching the S7 Program folder, use the cursor key [↓] key to open the Blocks folder.

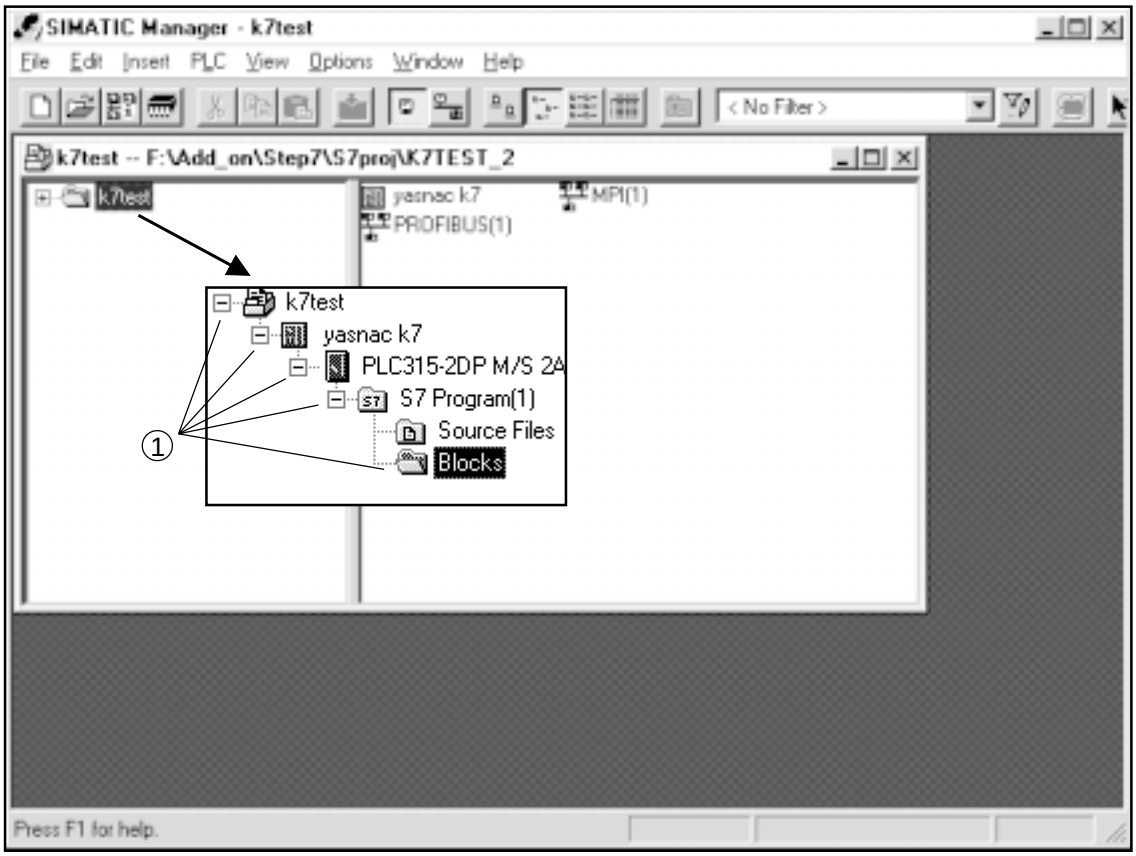


Fig. 2.2(a) SIMANTIC Manager Screen

② Press the Alt key, followed by the L key to open PLC's submenu. Using the cursor keys ↑ and ↓, move the cursor to Operating Mode ... in the submenu and press the INPUT key.

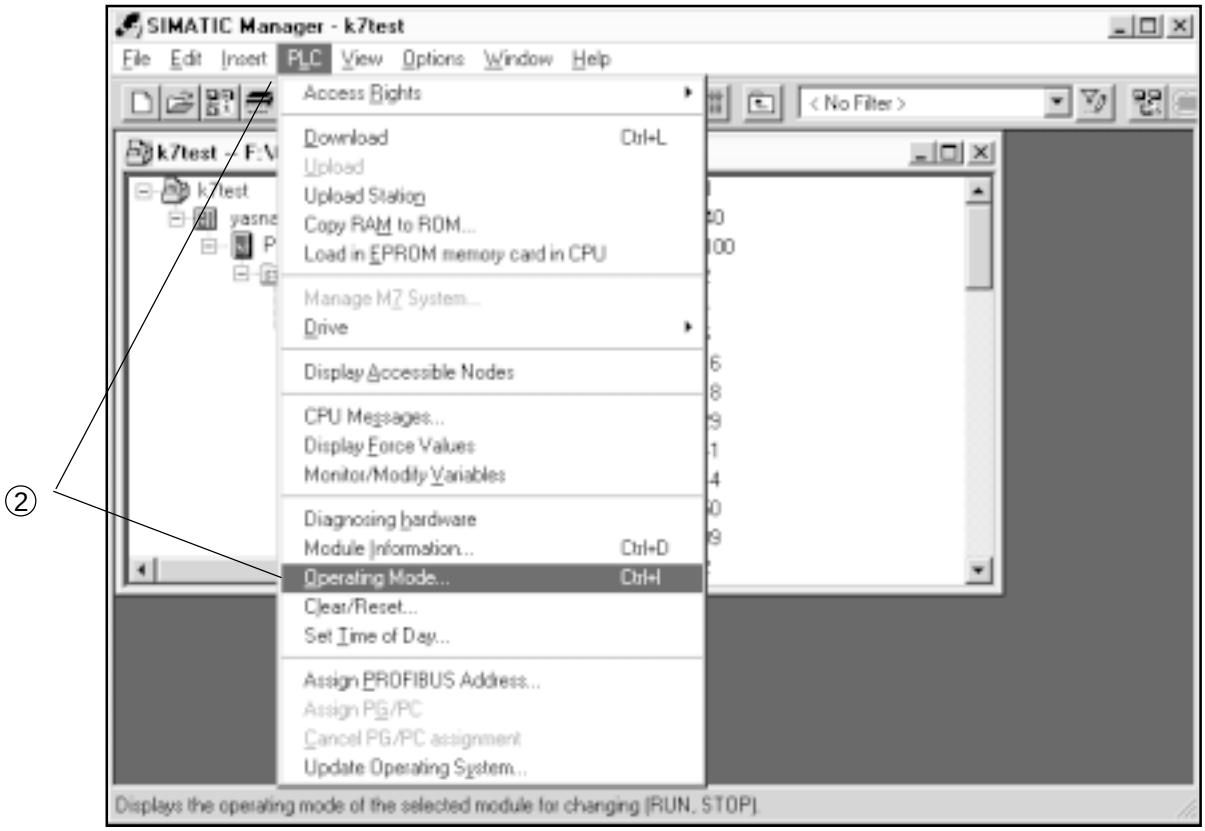


Fig. 2.2(b) Operating Mode Selection Screen

③ Use the TAB key to move the cursor to Stop, and press the INPUT key.

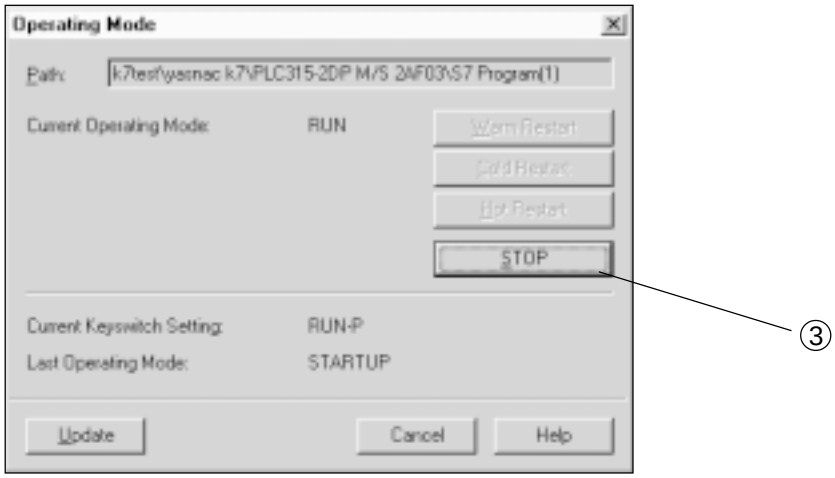


Fig. 2.2(c) Operating Mode Screen

④ A message, "Do you want to stop the module?" appears. Use the TAB key to move the cursor to Yes, and press the INPUT key.

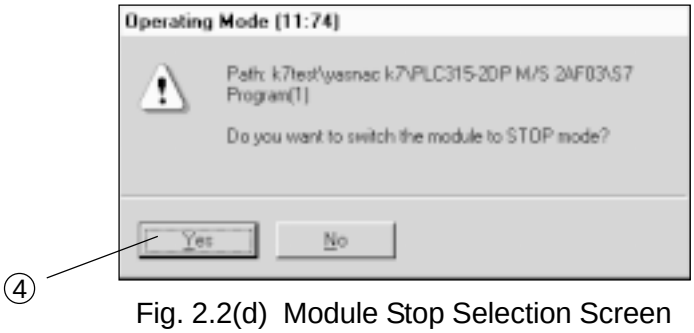


Fig. 2.2(d) Module Stop Selection Screen

⑤ Confirming that Current Operating Mode shows STOP, use the TAB key to move the cursor to Close, and press the INPUT KEY.

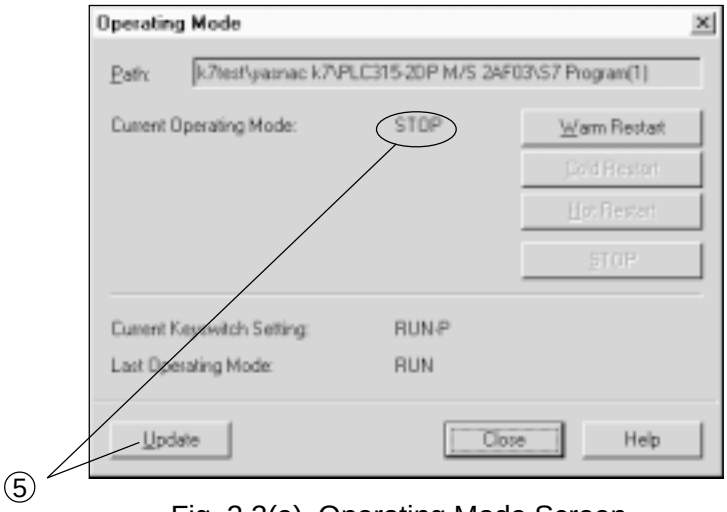


Fig. 2.2(e) Operating Mode Screen

⑥ Press the Alt key, followed by the F key to open File's submenu. Using the cursor keys ↑ and ↓, move the cursor to Download in the submenu and press the INPUT key.

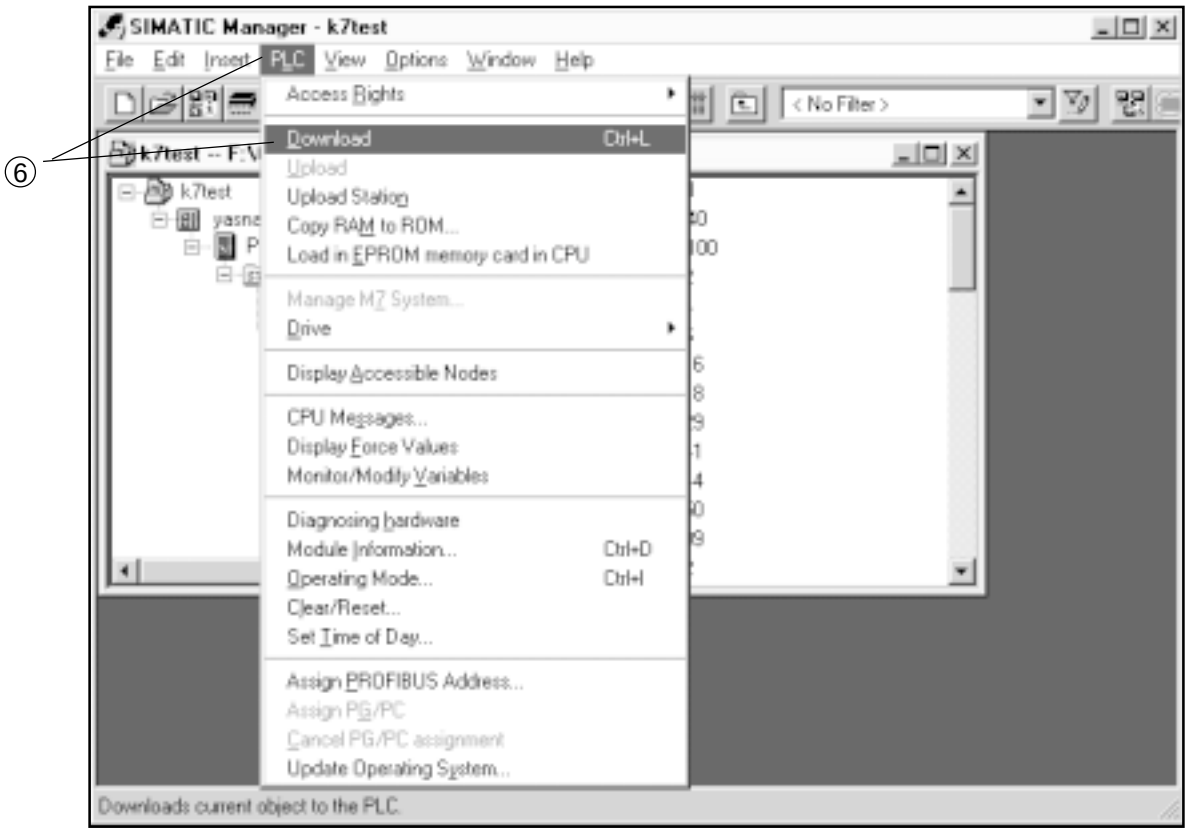


Fig. 2.2(f) Download Selection Screen

⑦ A message, "Object already exists. Do you want to overwrite?" appears. Use the TAB key to move the cursor to ALL, and press the INPUT key.

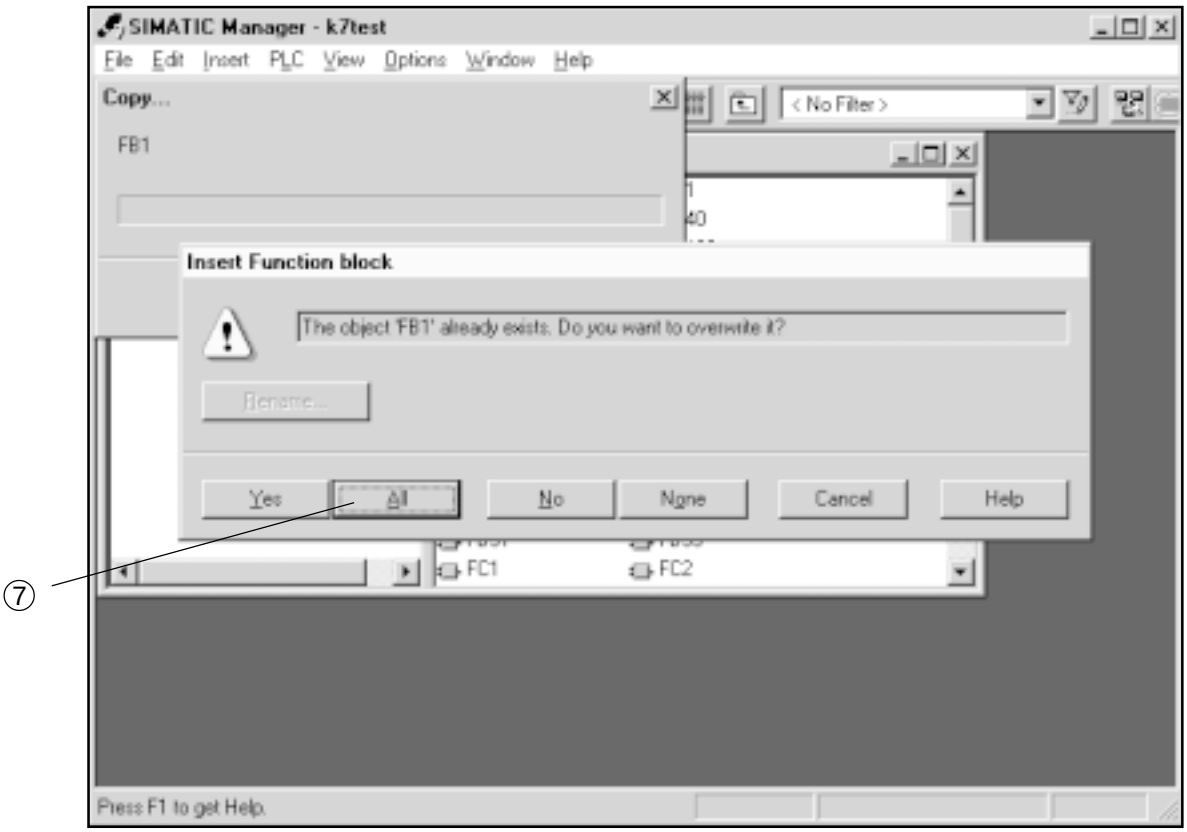


Fig. 2.2(g) Insert Function Block Screen

⑧ A message, "Do you want to load the system data?" appears. Use the TAB key to move cursor to Yes, and press the INPUT key.

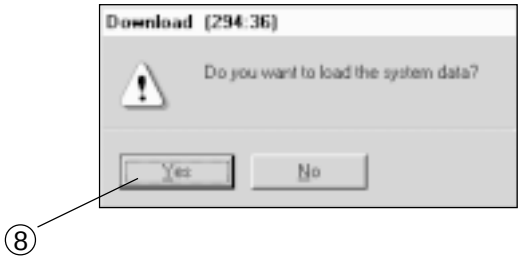


Fig. 2.2(h) Download Screen

⑨ Use the TAB key to move the cursor to Yes, and press the INPUT key.

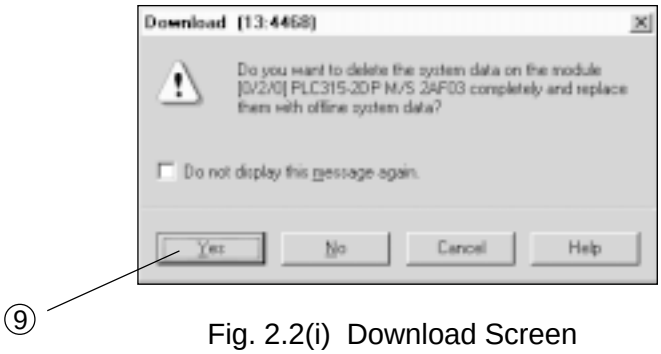


Fig. 2.2(i) Download Screen

⑩ Use the TAB key to move the cursor to Yes, and press the INPUT key.

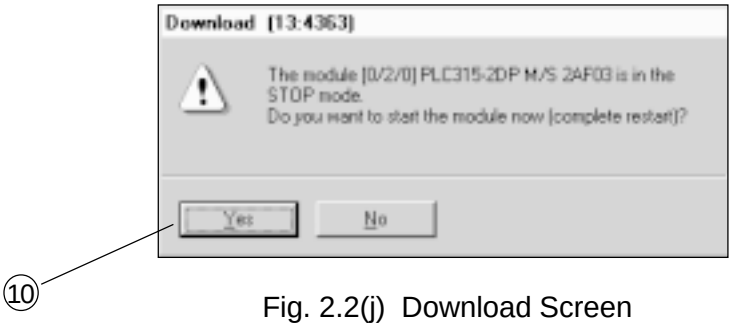


Fig. 2.2(j) Download Screen

⑪ Press the Alt key, followed by the F key to open File's submenu. Using the cursor keys ↑ and ↓, move the cursor to Exit in the submenu and press the INPUT key to terminate Step 7.

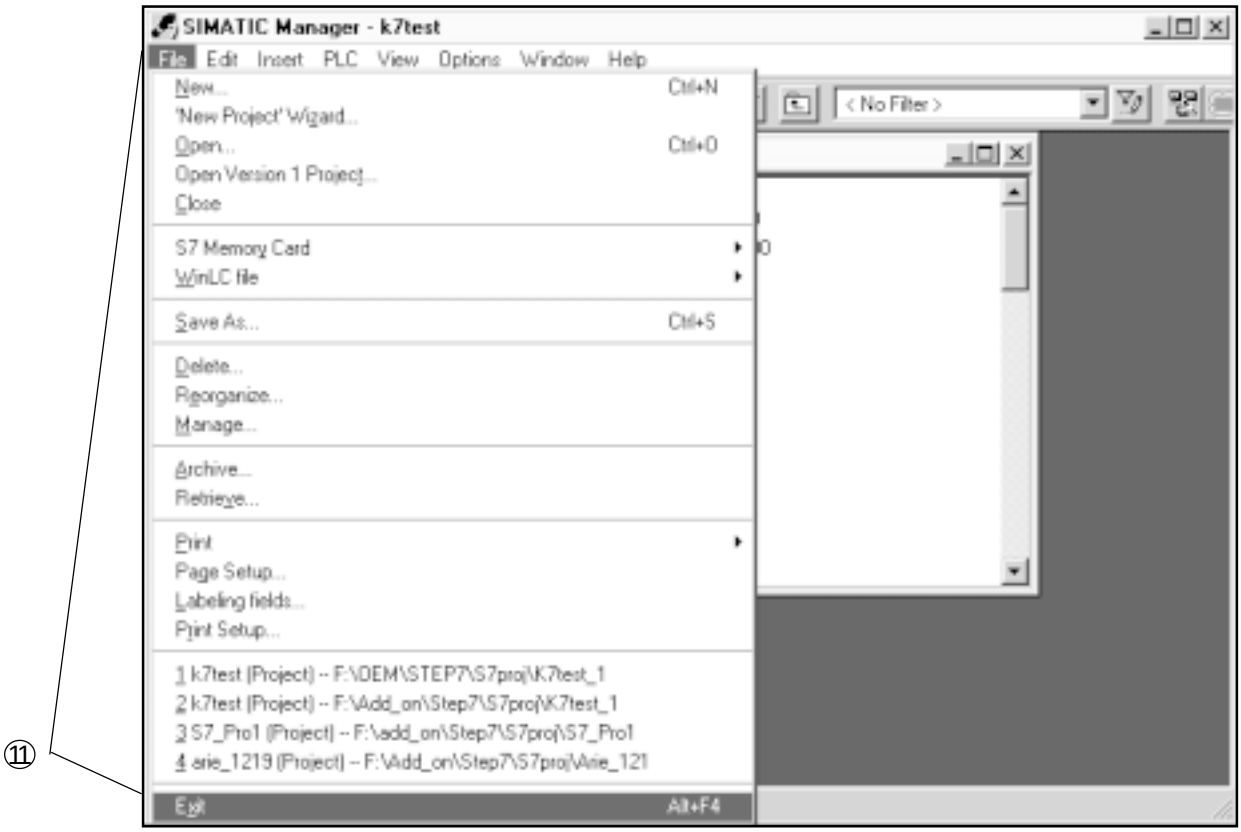


Fig. 2.2(j) EXIT Selection Screen

⑫ Press the MENU SELECT key on the operation panel, followed by the Start-up function key.

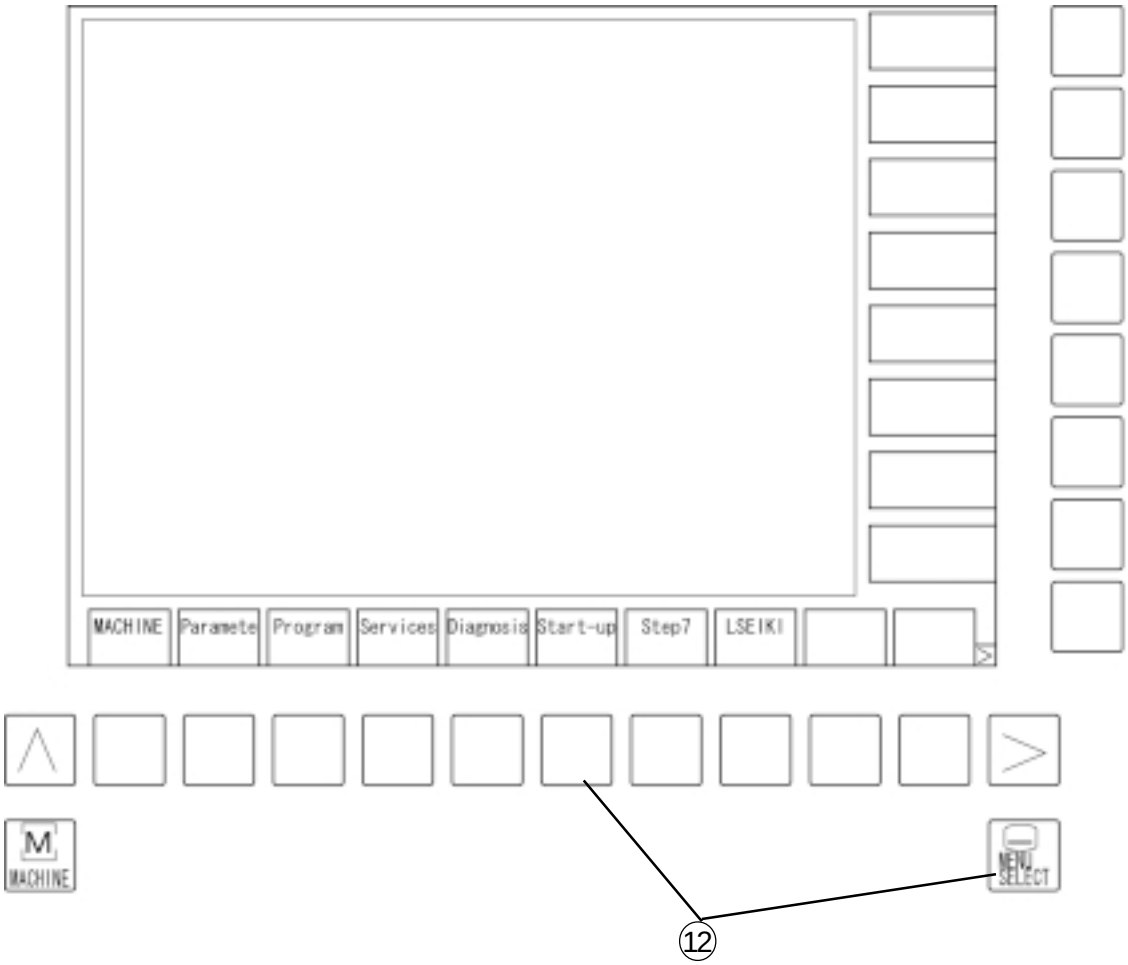


Fig. 2.2(k) Y-screen

⑬ Press the NCK Reset function key on the right side. Then, press the OK function key displayed further to the right, and wait for a while to terminate. If a drive related alarm is indicated, reset it. If it cannot be cleared, turn on the servo power again.

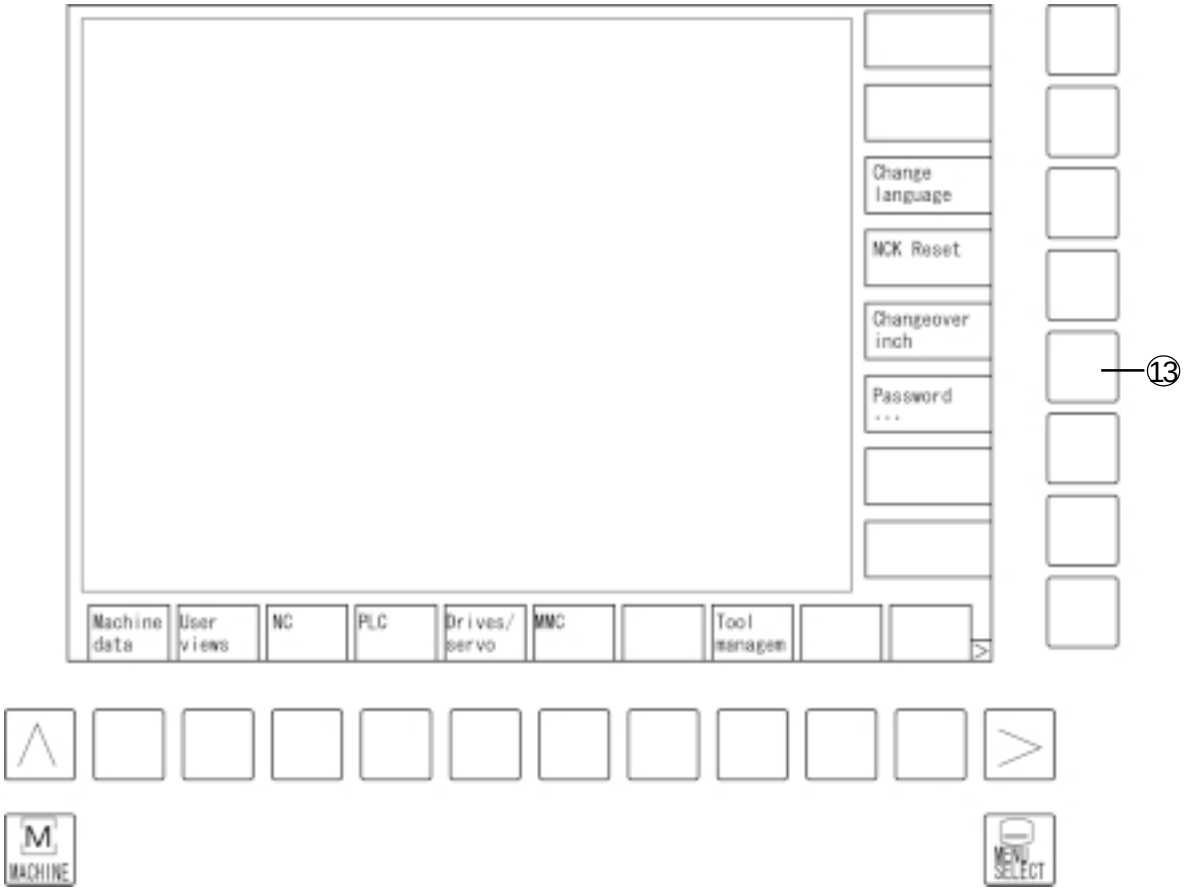


Fig. 2.2(l) Y-screen

3. SERVO TRACE OPERATION

3.1 Outline

- Use of the servo trace function allows you to monitor a servo signal and the status in the screen.
- Up to 4 data (Trace-1 to Trace-4) can be measured.
- A trigger is always applied to Trace-1.

3.2 Basic Screen

The Servo Trace Basic screen can be displayed by selecting the Yasukawa screen, "Startup," "Drive Servo," and "Servo Trace" in that order.

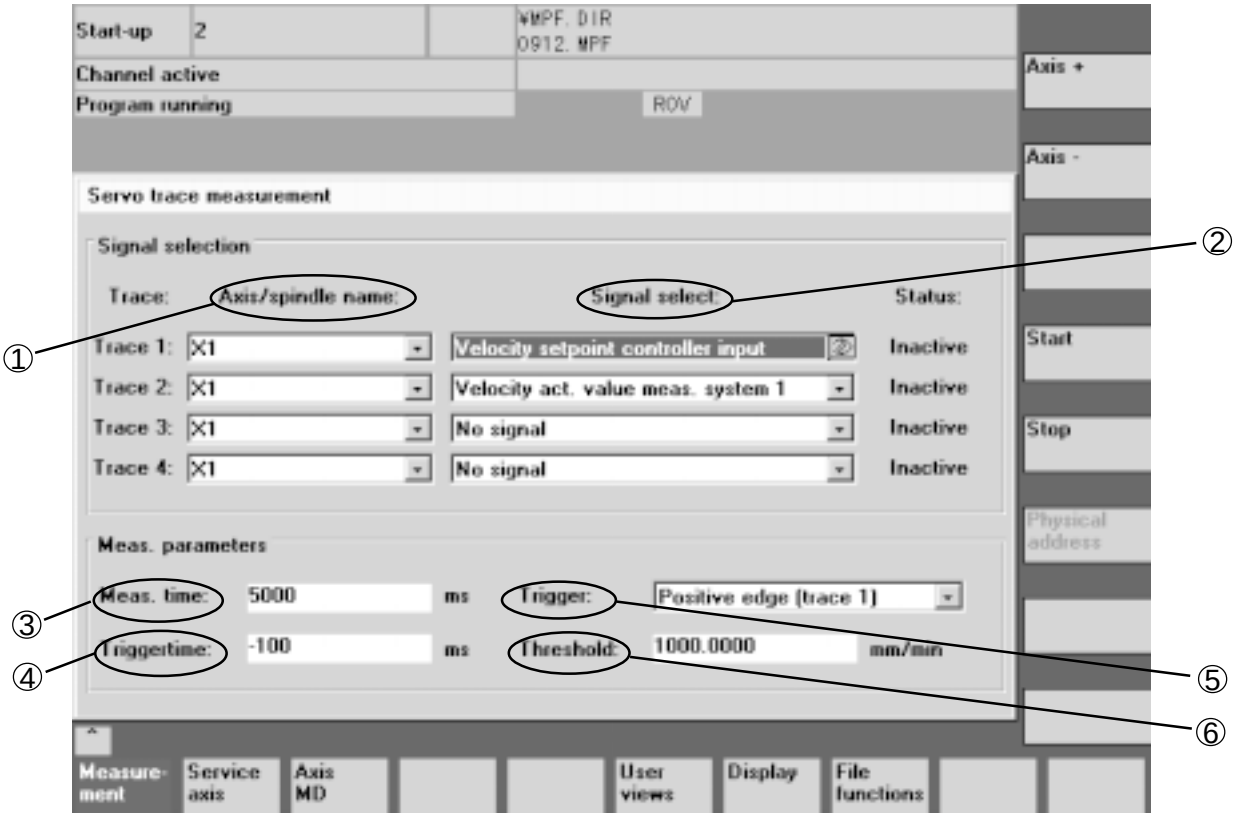


Fig. 3.2 Servo Trace Screen

① Select the axis/spindle to be measured.

② Select the signal to be measured.

③ Set the measurement time.

④ Set the trigger time.

When the trigger time is negative, pre-trigger time can be displayed. Set that time. If no sign is given to the trigger time (when the trigger time is positive), the display will appear in some time after triggering. Set that display delay time.

(Make setting so that the trigger time + measurement time will be equal to or greater than 0.)

⑤ Select a trigger type.
When "No Trigger" is selected, the "Start" key starts measurement.
When "Positive Edge" is selected, a trigger is applied when the data exceeds a threshold value in the positive direction.
When "Negative Edge" is selected, a trigger is applied when the data exceeds a threshold value in the negative direction.

⑥ Set the trigger threshold value (at which a trigger is applied).

3.3 Executing the Measurement

① If "No Trigger" has been selected, pressing the [Measure] key starts measurement.
When this is done, a message, "Servo trace function was triggered," appears at the lower left of the screen.
If a trigger has been set, the system will wait for it and starts measurement when it is applied.
A message, "Servo trace function started," appears in the trigger wait state, and another one, "Servo trace function was triggered," appears when a trigger is applied.

② Measurement can be cancelled by pressing the [Stop] or [Reset] key. The cancelled data cannot be displayed.

③ Measurement is completed at the end of the measurement time.
A message, "Servo trace function ended," appears.

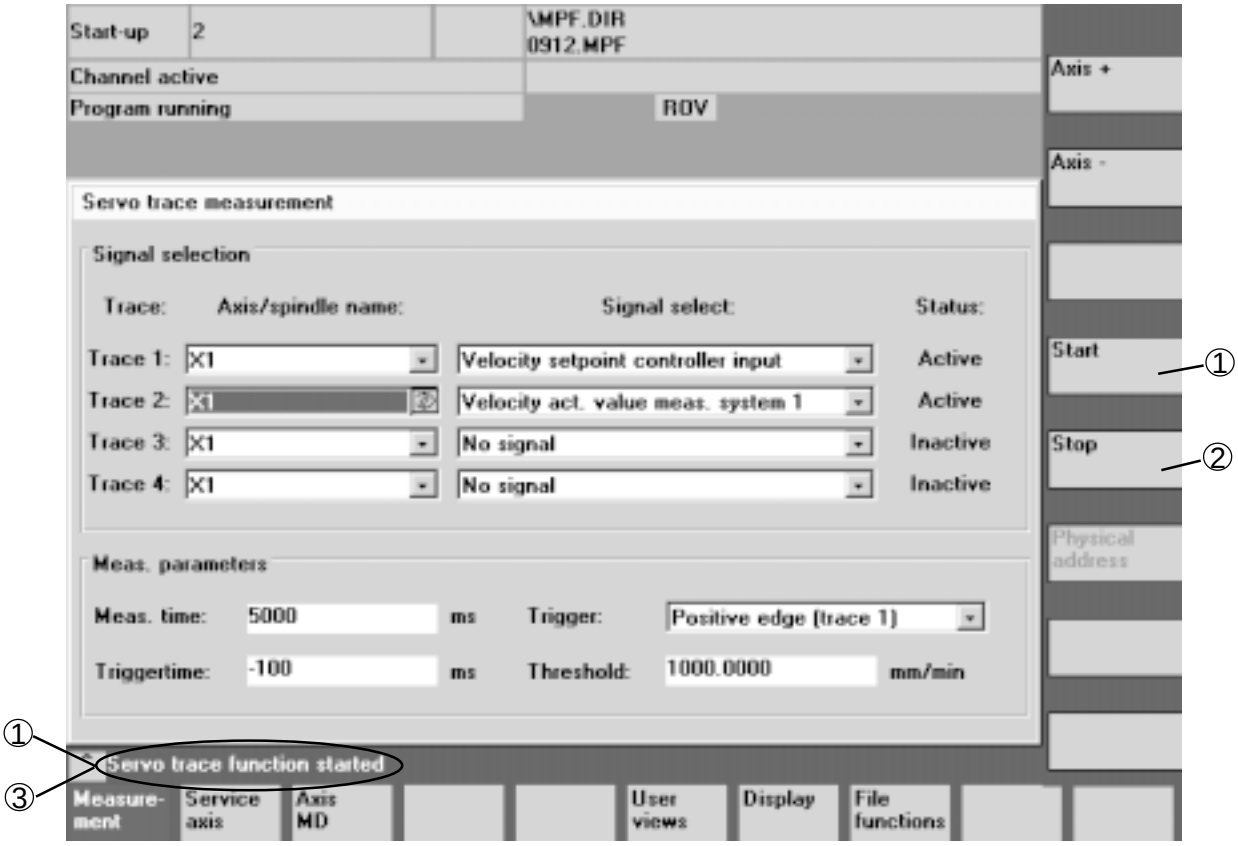


Fig. 3.3 Servo Trace Screen

3.4 Display

Pressing the [Display] key displays the measurement results.

Traces-1 and -2 are displayed in Graph-1, and Traces-3 and -4 in Graph-2, respectively.

Fig. 3.4(a) Trace Screen

① "X Marker ON," "Y Marker ON"

Pressing either key displays a marker in the screen; X-marker indicates the X-axis value and data value at the marker position, and Y-marker the Y-axis value at the marker position, respectively.

The X- and Y-marker are moved by the cursor move keys.

② "Scale" key

Displays the scaling screen. If scaling is set to Fixed, the Y-axis max. and min. values can be set. You can also specify whether the marker is to be given to Trace-1 or -2 for Graph-1, and to Trace-3 or -4 for Graph-2.

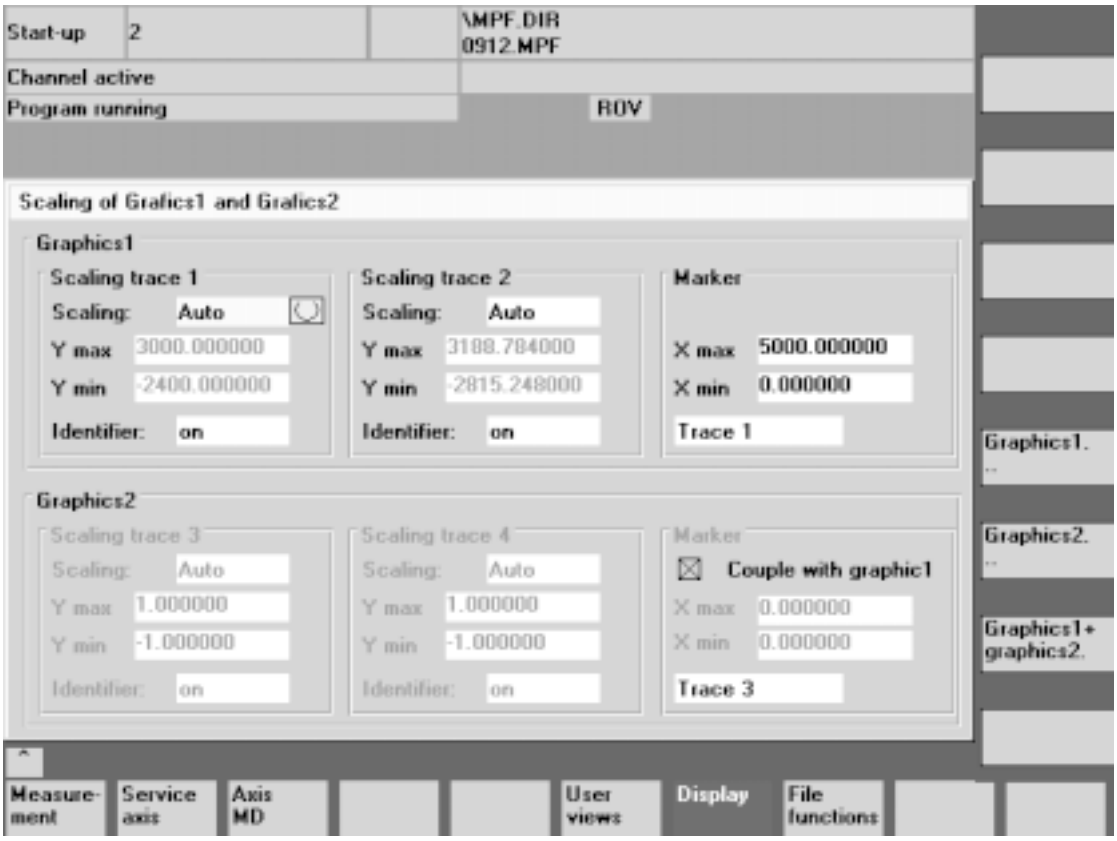


Fig. 3.4(b) Graph Scaling Screen

③ "Set Graph" key

Capable of choosing to display Graph-1, Graph-2, or Graph-1 + Graph-2 simultaneously.

④ "Trace 1+2" key

Switches to "Trace 1" and "Trace 2." Displays Trace-1 and Trace-2 simultaneously, Trace-1, or Trace-2, respectively.

("Trace 3+4" key for Graph-2)

If you choose to display Graph-1 and Trace-1, for example, the following screen will be displayed.

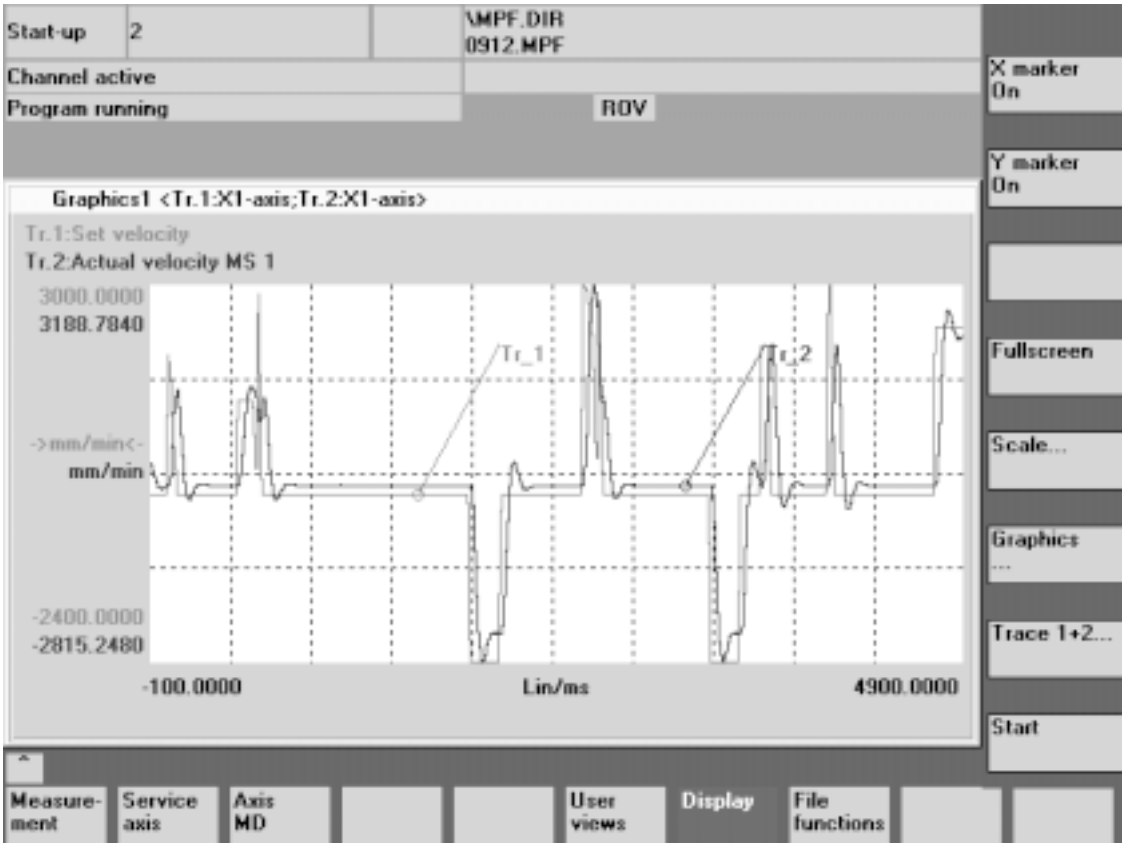


Fig. 3.4(c) Graph Screen

SEICOS - pcFLexi

INSTRUCTION MANUAL

MAINTENANCE

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