

NexAIoT Co., Ltd.

iAT2000 System

IoT Automation Solutions

CNC Gateway

NISE 105-CNC Gateway_5

User Manual

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PREFACE

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Acknowledgements

NISE 105 is a trademark of NEXCOM International Co., Ltd. All other product names mentioned herein are registered trademarks of their respective owners.

Regulatory Compliance Statements

This section provides the FCC compliance statement for Class B devices and describes how to keep the system CE compliant.

Declaration of Conformity

FCC

This equipment has been tested and verified to comply with the limits for a Class B digital device, pursuant to Part 15 of FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. Operation of this equipment in a residential area (domestic environment) is likely to cause harmful interference, in which case the user will be required to correct the interference (take adequate measures) at their own expense.

CE

The product(s) described in this manual complies with all applicable European Union (CE) directives if it has a CE marking. For computer systems to remain CE compliant, only CE-compliant parts may be used. Maintaining CE compliance also requires proper cable and cabling techniques.

RoHS Compliance



NEXCOM RoHS Environmental Policy and Status Update

NEXCOM is a global citizen for building the digital infrastructure. We are committed to providing green products and services, which are compliant with European Union RoHS (Restriction on Use of Hazardous Substance in Electronic Equipment) directive 2011/65/EU, to be your trusted green partner and to protect our environment.

RoHS restricts the use of Lead (Pb) < 0.1% or 1,000ppm, Mercury (Hg) < 0.1% or 1,000ppm, Cadmium (Cd) < 0.01% or 100ppm, Hexavalent Chromium (Cr6+) < 0.1% or 1,000ppm, Polybrominated biphenyls (PBB) < 0.1% or 1,000ppm, and Polybrominated diphenyl Ethers (PBDE) < 0.1% or 1,000ppm.

In order to meet the RoHS compliant directives, NEXCOM has established an engineering and manufacturing task force to implement the introduction of green products. The task force will ensure that we follow the standard NEXCOM development procedure and that all the new RoHS components and new manufacturing processes maintain the highest industry quality levels for which NEXCOM are renowned.

The model selection criteria will be based on market demand. Vendors and suppliers will ensure that all designed components will be RoHS compliant.

How to recognize NEXCOM RoHS Products?

For existing products where there are non-RoHS and RoHS versions, the suffix "(LF)" will be added to the compliant product name.

All new product models launched after January 2013 will be RoHS compliant. They will use the usual NEXCOM naming convention.

Warranty and RMA

NEXCOM Warranty Period

NEXCOM manufactures products that are new or equivalent to new in accordance with industry standard. NEXCOM warrants that products will be free from defect in material and workmanship for 2 years, beginning on the date of invoice by NEXCOM. HCP series products (Blade Server) which are manufactured by NEXCOM are covered by a three year warranty period.

NEXCOM Return Merchandise Authorization (RMA)

- Customers shall enclose the “NEXCOM RMA Service Form” with the returned packages.
- Customers must collect all the information about the problems encountered and note anything abnormal or, print out any on-screen messages, and describe the problems on the “NEXCOM RMA Service Form” for the RMA number apply process.
- Customers can send back the faulty products with or without accessories (manuals, cable, etc.) and any components from the card, such as CPU and RAM. If the components were suspected as part of the problems, please note clearly which components are included. Otherwise, NEXCOM is not responsible for the devices/parts.
- Customers are responsible for the safe packaging of defective products, making sure it is durable enough to be resistant against further damage and deterioration during transportation. In case of damages occurred during transportation, the repair is treated as “Out of Warranty.”
- Any products returned by NEXCOM to other locations besides the customers’ site will bear an extra charge and will be billed to the customer.

Repair Service Charges for Out-of-Warranty Products

NEXCOM will charge for out-of-warranty products in two categories, one is basic diagnostic fee and another is component (product) fee.

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NEXCOM will charge for out-of-warranty products in two categories, one is basic diagnostic fee and another is component (product) fee.

System Level

- Component fee: NEXCOM will only charge for main components such as SMD chip, BGA chip, etc. Passive components will be repaired for free, ex: resistor, capacitor.
- Items will be replaced with NEXCOM products if the original one cannot be repaired. Ex: motherboard, power supply, etc.
- Replace with 3rd party products if needed.
- If RMA goods can not be repaired, NEXCOM will return it to the customer without any charge.

Board Level

- Component fee: NEXCOM will only charge for main components, such as SMD chip, BGA chip, etc. Passive components will be repaired for free, ex: resistors, capacitors.
- If RMA goods can not be repaired, NEXCOM will return it to the customer without any charge.

Warnings

Read and adhere to all warnings, cautions, and notices in this guide and the documentation supplied with the chassis, power supply, and accessory modules. If the instructions for the chassis and power supply are inconsistent with these instructions or the instructions for accessory modules, contact the supplier to find out how you can ensure that your computer meets safety and regulatory requirements.

Cautions

Electrostatic discharge (ESD) can damage system components. Do the described procedures only at an ESD workstation. If no such station is available, you can provide some ESD protection by wearing an antistatic wrist strap and attaching it to a metal part of the computer chassis.

Safety Information

Before installing and using the device, note the following precautions:

- Read all instructions carefully.
- Do not place the unit on an unstable surface, cart, or stand.
- Follow all warnings and cautions in this manual.
- When replacing parts, ensure that your service technician uses parts specified by the manufacturer.
- Avoid using the system near water, in direct sunlight, or near a heating device.
- The load of the system unit does not solely rely for support from the rackmounts located on the sides. Firm support from the bottom is highly necessary in order to provide balance stability.
- The computer is provided with a battery-powered real-time clock circuit. There is a danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.
- There must be a disconnect device in front of "NISE 105" to keep the worker or field side maintainer be cautious and aware to close the general power supply before they start to do maintenance. The disconnect device hereby means a 20A circuit-breaker. Power installation must be performed with qualified electrician and followed with National Electrical Code, ANSI/NFPA 70 and Canadian Electrical Code, Part I, CSA C22.1.

- The front of the Equipment requires wiring terminals with the following specifications:

Wire size: 12-24 AWG

Wire Type: copper wire only



Danger of explosion if battery is incorrectly replaced. Replace with the same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.

Installation Recommendations

Ensure you have a stable, clean working environment. Dust and dirt can get into components and cause a malfunction. Use containers to keep small components separated.

Adequate lighting and proper tools can prevent you from accidentally damaging the internal components. Most of the procedures that follow require only a few simple tools, including the following:

- A Philips screwdriver
- A flat-tipped screwdriver
- A grounding strap
- An anti-static pad

Using your fingers can disconnect most of the connections. It is recommended that you do not use needle-nose pliers to disconnect connections as these can damage the soft metal or plastic parts of the connectors.

Safety Precautions

1. Read these safety instructions carefully.
2. Keep this User Manual for later reference.
3. Disconnect this equipment from any AC outlet before cleaning. Use a damp cloth. Do not use liquid or spray detergents for cleaning.
4. For plug-in equipment, the power outlet socket must be located near the equipment and must be easily accessible.
5. Keep this equipment away from humidity.
6. Put this equipment on a stable surface during installation. Dropping it or letting it fall may cause damage.
7. The openings on the enclosure are for air convection to protect the equipment from overheating. **DO NOT COVER THE OPENINGS.**
8. Make sure the voltage of the power source is correct before connecting the equipment to the power outlet.
9. Place the power cord in a way so that people will not step on it. Do not place anything on top of the power cord. Use a power cord that has been approved for use with the product and that it matches the voltage and current marked on the product's electrical range label. The voltage and current rating of the cord must be greater than the voltage and current rating marked on the product.
10. All cautions and warnings on the equipment should be noted.
11. If the equipment is not used for a long time, disconnect it from the power source to avoid damage by transient overvoltage.
12. Never pour any liquid into an opening. This may cause fire or electrical shock.
13. Never open the equipment. For safety reasons, the equipment should be opened only by qualified service personnel.
14. If one of the following situations arises, get the equipment checked by service personnel:
 - a. The power cord or plug is damaged.
 - b. Liquid has penetrated into the equipment.
 - c. The equipment has been exposed to moisture.
 - d. The equipment does not work well, or you cannot get it to work according to the user's manual.
 - e. The equipment has been dropped and damaged.
 - f. The equipment has obvious signs of breakage.
15. Do not place heavy objects on the equipment.
16. The unit uses a three-wire ground cable which is equipped with a third pin to ground the unit and prevent electric shock. Do not defeat the purpose of this pin. If your outlet does not support this kind of plug, contact your electrician to replace your obsolete outlet.
17. **CAUTION: DANGER OF EXPLOSION IF BATTERY IS INCORRECTLY REPLACED. REPLACE ONLY WITH THE SAME OR EQUIVALENT TYPE RECOMMENDED BY THE MANUFACTURER. DISCARD USED BATTERIES ACCORDING TO THE MANUFACTURER'S INSTRUCTIONS.**

Technical Support and Assistance

1. For the most updated information of NEXCOM products, visit NEXCOM's website at www.nexcom.com.
2. For technical issues that require contacting our technical support team or sales representative, please have the following information ready before calling:
 - Product name and serial number
 - Detailed information of the peripheral devices
 - Detailed information of the installed software (operating system, version, application software, etc.)
 - A complete description of the problem
 - The exact wordings of the error messages

Warning!

1. Handling the unit: carry the unit with both hands and handle it with care.
2. Maintenance: to keep the unit clean, use only approved cleaning products or clean with a dry cloth.
3. CompactFlash: Turn off the unit's power before inserting or removing a CompactFlash storage card.

Conventions Used in this Manual



Warning:

Information about certain situations, which if not observed, can cause personal injury. This will prevent injury to yourself when performing a task.



Caution:

Information to avoid damaging components or losing data.



Note:

Provides additional information to complete a task easily.



Safety Warning: This equipment is intended for installation in a Restricted Access Location only.

CHAPTER 1: PRODUCT INTRODUCTION

Overview



Key Features

- Onboard Intel® Atom™ processor E3826 dual core, 1.46GHz
- Dual independent display from DVI-I and HDMI
- 2 x Intel® I120IT LAN ports support WoL, Teaming and PXE
- 2 x USB 2.0 & 1 x USB 3.0
- 4 x COM ports (COM1 & COM2 with RS232/422/485, jumper-free setting)
- 1 x Optional interface for optional Wi-Fi/3.5G/Automation modules
- External RTC battery holder for easy replacement
- Support -20 ~ 70 degree C extended operating temperature
- Support 9-30VDC input

Hardware Specifications

CPU Support

- Onboard Intel® Atom™ processor E3826 Dual Core, 1.46GHz

Main Memory

- 1x DDR3L SO-DIMM socket, supports DDR3L 1066/1333 4GB RAM max., un-buffered and non-ECC

Display Option

- Dual independent display
 - HDMI and DVI-D
 - HDMI and VGA (via DVI-I to VGA converter)

I/O Interface - Front

- ATX power on/off switch
- 1 x Power Status/1 x HDD Access/1 x Battery Low/1 x Programming LEDs
- 1 x External CFast socket
- 1 x SIM card holder
- 2 x Intel® I210IT GbE LAN Ports, support Wake on LAN, Teaming and PXE
- 1 x DVI-I display output
- 1 x USB 3.0 (900mA per port)
- 1 x USB 2.0 (500mA per port)
- 2 x DB9 for COM1 & COM2, both support RS232/422/485 with auto flow control
 - Jumper-free setting on RS232/422/485
 - Support 5V/12V/Ring function by jumper setting, Ring as the default option (COM2 only)
- 1 x Remote power ON/OFF switch
- 1 x 2-pin DC input, support +9 to 30VDC input

I/O Interface - Rear

- 1 x USB 2.0
- 1 x HDMI
- 1 x RTC battery
- 2 x DB9 for COM3 & COM4
 - NISE 105: support RS232 only
- 1 x Mic-in & 1 x line-out
- 2 x Antenna holes for optional Wi-Fi/3.5G antennas
- 1 x optional I/F for optional mini-PCIe Wi-Fi/3.5G/Hilscher automation module output

I/O Interface - Internal

- 4 x GPI and 4 x GPO (5V, TTL Type)

Storage Device

- 1 x CFast (SATA2.0)
- 1 x SSD 2.5" SATA3 128GB

Expansion Slot

- 1 x Mini-PCIe socket for optional Wi-Fi/3.5G/Hilscher automation modules

Power Requirements

- Power input: +9VDC to 30VDC, 6.6a to 2a

OS Installation

- Windows 7 Service Pack 2

Dimensions

- 185mm (W) x 131mm (D) x 54mm (H) without wall-mount bracket

Construction

- Aluminum and metal chassis with fanless design

Environment

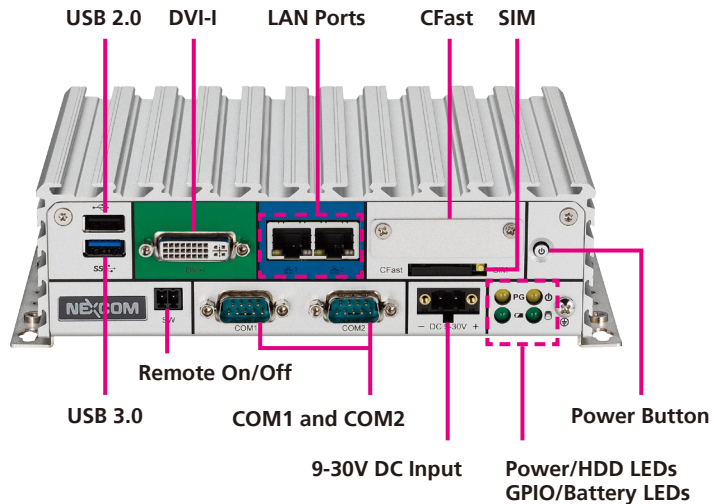
- Operating temperature:
Ambient with air flow: -20°C to 70°C with industrial grade device
(According to IEC60068-2-1, IEC60068-2-2, IEC60068-2-14)
- Storage temperature: -30°C to 85°C
- Relative humidity: 10% to 95% (non-condensing)
- Shock protection:
 - HDD: 20G, half sine, 11ms, IEC60068-27
 - CFast: 50G, half sine, 11ms, IEC60068-27
- Vibration protection w/HDD condition:
 - Random: 0.5Grms @ 5~500 Hz, IEC60068-2-64
 - Sinusoidal: 0.5Grms @ 5~500 Hz, IEC60068-2-6
- Vibration protection w/CFast & SSD condition:
 - Random: 2Grms @ 5~500 Hz, IEC60068-2-64
 - Sinusoidal: 2Grms @ 5~500 Hz, IEC60068-2-6

Certifications

- CE
- FCC Class A
- UL/cUL

Knowing Your CNC Gateway

Front Panel



USB 2.0

USB 2.0 port to connect the system with USB 2.0/1.1 devices.

USB 3.0

USB 3.0 port to connect the system with USB 3.0/2.0 devices.

DVI-I

Used to connect a digital LCD panel.

Remote On/Off Switch

Used to connect a remote to power on/off the system.

LAN Ports

Two LAN ports used to connect the system to a local area network.

COM1 and COM2

Two DB9 ports used to connect RS232/422/485 compatible devices.

CFast Slot

Used to insert a CFast card.

SIM Slot

Used to insert a SIM card.

9-30V DC Input

Used to plug a DC power cord.

Power/HDD LEDs

Indicates the power status and HDD activity of the system.

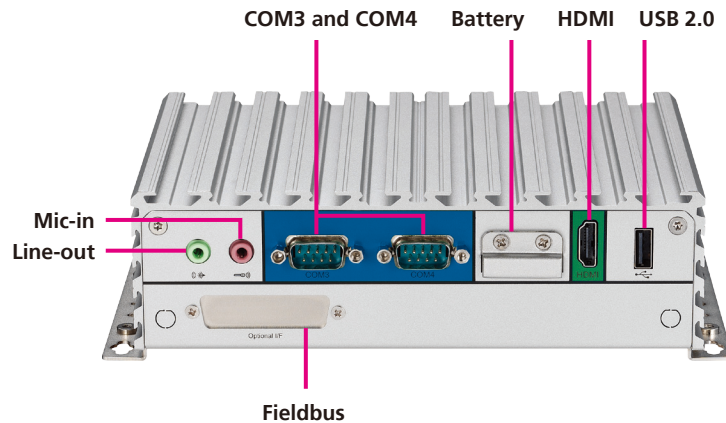
GPIO/Battery LEDs

Indicates the status of the battery and GPIO.

Power Button

Press to power-on or power-off the system.

Rear Panel



Line-out

Used to connect a headphone or a speaker.

Mic-in

Used to connect an external microphone.

COM3 and COM4

Two DB9 ports used to connect RS232/422/485 compatible devices.

Battery Slot

Used to hold an external battery.

HDMI

Used to connect a high-definition display.

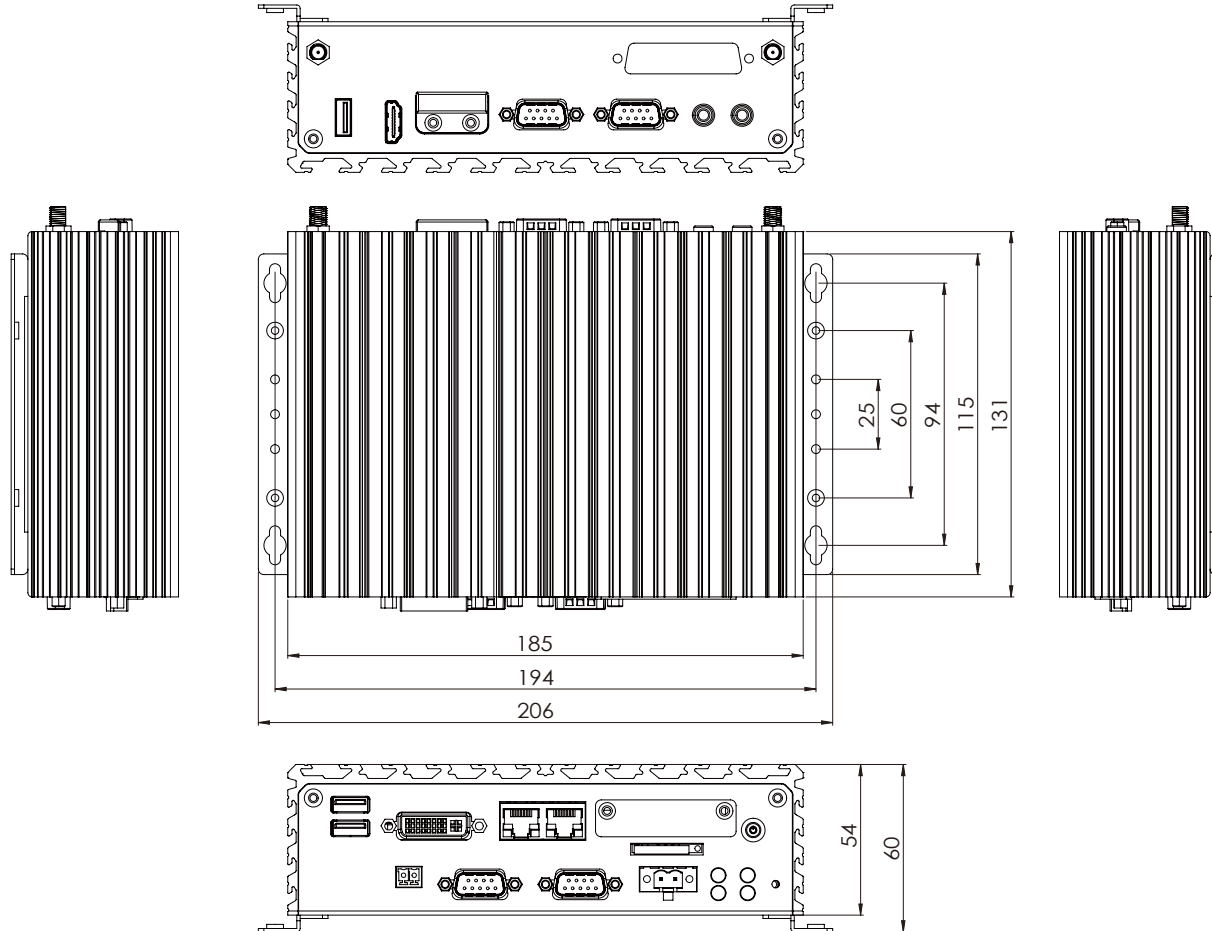
USB 2.0

USB 2.0 port to connect the system with USB 2.0/1.1 devices.

Fieldbus

Expansion slot for add-on fieldbus modules.

Mechanical Dimensions



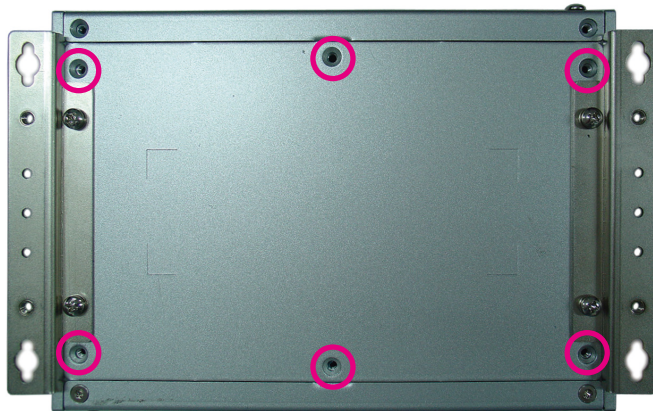
CHAPTER 2: SYSTEM SETUP

Removing the Chassis Cover

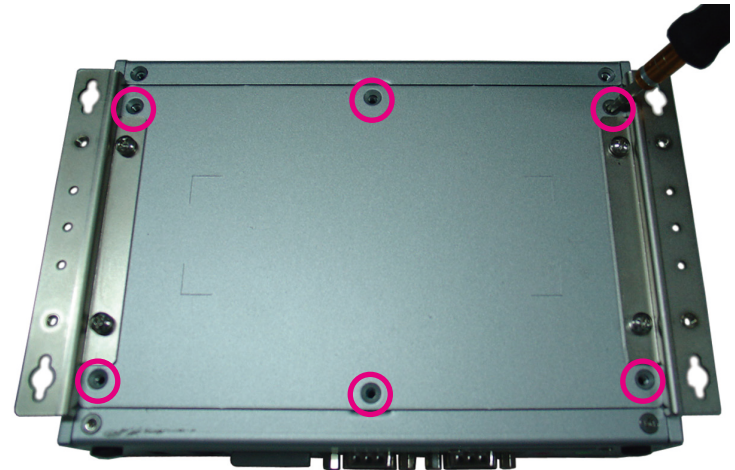


Prior to removing the chassis cover, make sure the unit's power is off and disconnected from the power sources to prevent electric shock or system damage.

1. Locate the 6 screws on the bottom side of the chassis cover.



2. Remove the 6 screws on the bottom side of the chassis cover.

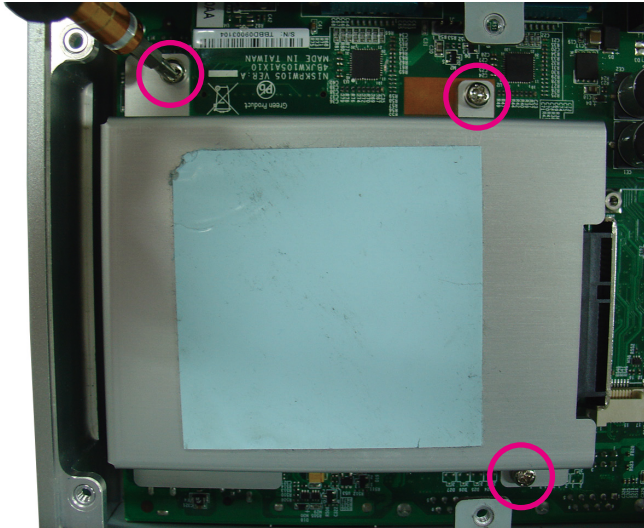


3. Remove the chassis cover.

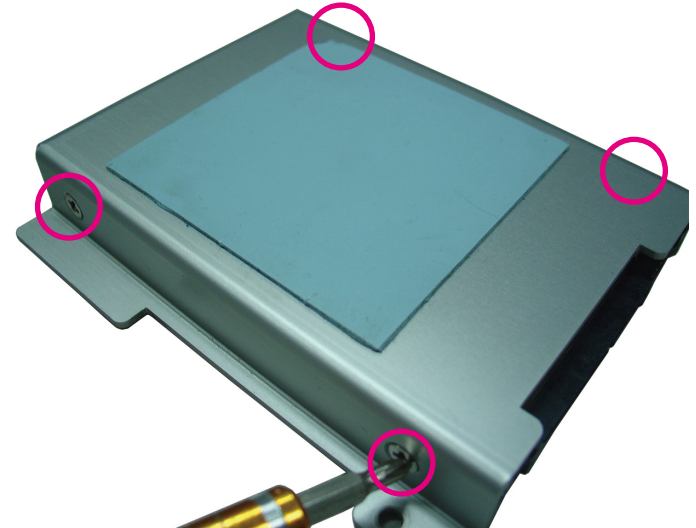


Installing a SATA Hard Drive

1. Remove the bottom cover before installing a SATA HDD.
2. Locate the internal HDD bracket and remove all the 3 screws on the HDD bracket.



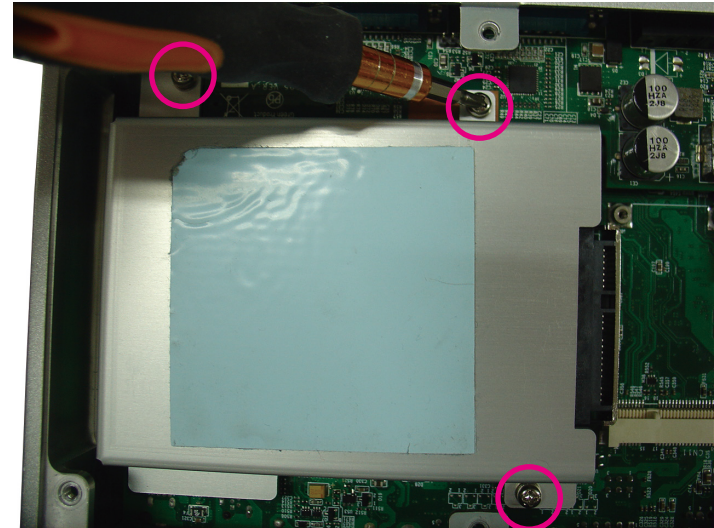
3. Place the 2.5" HDD into the internal HDD bracket then use the screws to secure the 2.5" HDD in place.



4. Place the internal HDD bracket into its original position.



5. Secure the internal HDD bracket by screwing the screws in a clockwise direction.

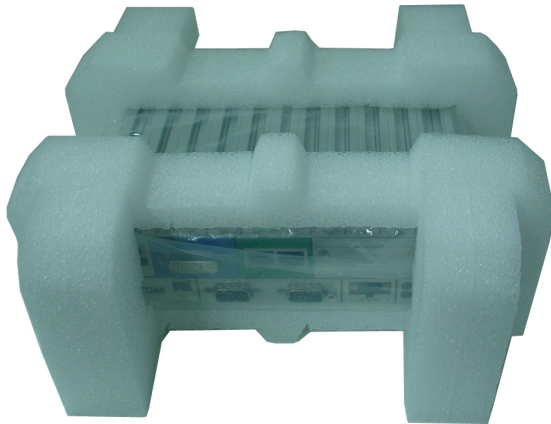


Packing



NISE 105 plastic bag and EPE reference.

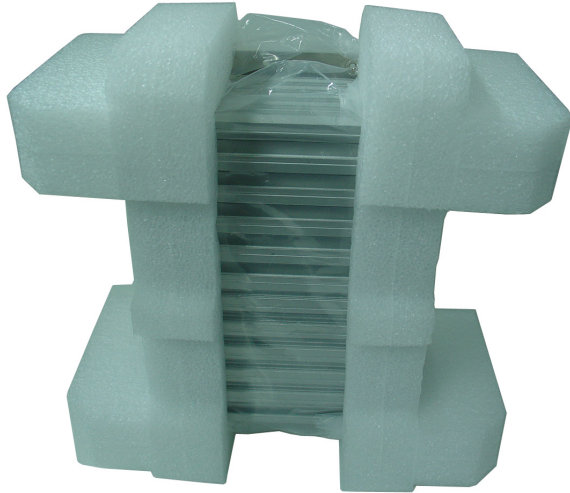
Front View of Packing



Rear View of Packing



Top View of Packing



Bottom View of Packing



CHAPTER 3: CNC GATEWAY GUIDE

3. CNC Gateway Introduction

iAT2000 CNC Gateway provides a convenient interface to integrate major CNC controllers into NEXCOM I4.0 Solution Network. The NEXCOM developed software contains APIs to gather data from the non-open CNC systems, and then uses SQL software to actively transfer data to the database. This gateway is a one-fits-all solution for all different types of CNC controllers in the market, greatly reducing the effort required for system integrators to develop various connection interfaces on their own. For crucial devices, system integrators can focus more development effort on monitoring and analytics, maximizing the effectiveness of factory automation.

Gateway Features

- Plug-and-play CNC gateway designed to integrate controllers to the industrial internet of machines.
- Support one-click connection to mainstream CNC controllers such as Fanuc, Mitsubishi, Heidenhain and Siemens.
- Collect important machine information including position, coordinate offsets, alarm, etc.
- Connect to on-demand combination of controllers with one CNC gateway
- Transfer data to iAT2000 SCADA or MySQL/SQLite database.
- Provide dashboard interface to monitor machine status.
- Connect up to a maximum of 5 or 10 CNC controllers via TCP/IP.
 - iAT2000 CNC-5 Gateway
 - iAT2000 CNC-10 Gateway

3.1 CNC Support

✓: Support P: Partial Function Support ✖: Not Supported

	Fanuc	Mitsubishi	Heidenhain	Siemens-OPC UA
Features	0i-B/0i-C/0i-D/ 16i/18i/21i/ 30i/31i/32i	M70/M700/ M80/M800	iTNC530/ TNC640	828D/840D
CNC Information	✓	✓	✓	✓
CNC Status	✓	✓	✓	✓
Position	✓	✓	✓	✓
G Code	✓	✓	✖	✓
othercode	✓	✓	✓	✓
feed/spindle	✓	✓	✓	✓
Time	✓	P	P	✓
PartCount	✓	✓	✓	✓
Current Alarm	✓	✓	✓	✓
Alarm History	✓	✓	✓	✓
Current Operation	✓	✖	✖	✖
Operation History	✓	✖	✖	✖
PLC Alarm	✓	✖	✖	✖

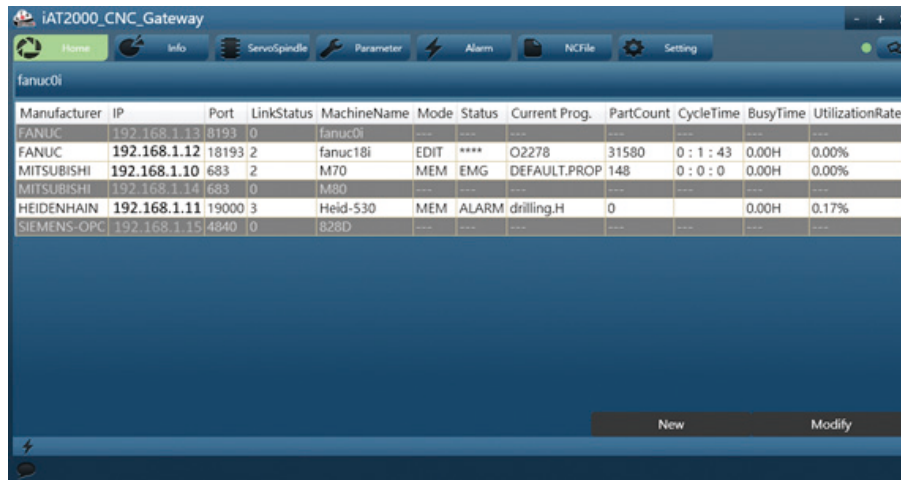
✓: Support P: Partial Function Support ✖: Not Supported

	Fanuc	Mitsubishi	Heidenhain	Siemens-OPC UA
Features	0i-B/0i-C/0i-D/ 16i/18i/21i/ 30i/31i/32i	M70/M700/ M80/M800	iTNC530/ TNC640	828D/840D
Servo Current	✓	✖	✖	✖
Servo	✓	✓	✓	✓
Spindle	✓	✓	✓	✓
Temperature	✓	✖	✓	✓
Tool Offset	✓	✓	✓	✖
SET Tool Offset Value	✓	✓	✓	✖
Tool Pocket	✖	✖	✓	✓
SET Tool Pocket	✖	✖	✓	✖
WorkCoord	✓	✓	✓	✖
SET WorkCoord	✓	✓	✓	✖
Macro	✓	✓	✖	✖
SET Macro	✓	✓	✖	✖
Program operation_MEM	✓	✓	✓	P
Program operation_FTP	✓	✓	✖	✖
SET NC main program	✓	✖	✖	✖

3.2 Software

3.2.1 CNC Gateway Page: Home

- Machine List
 - CNC Type (Manufacturer), IP, Port, LinkStatus, MachineName, etc.
- Set Machine & Data List



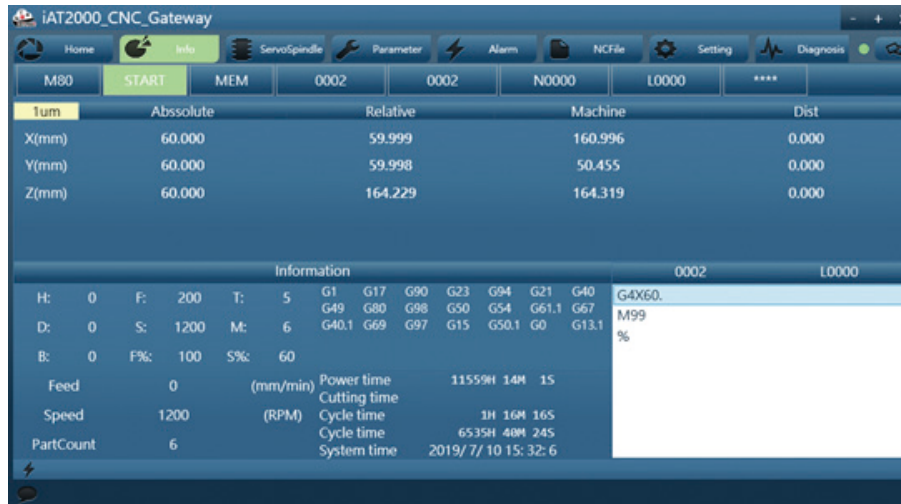
The screenshot shows the 'IAT2000_CNC_Gateway' application window. The title bar includes 'Home', 'Info', 'ServoSpindle', 'Parameter', 'Alarm', 'NFile', and 'Setting' buttons. The main content area displays a table with the following data:

Manufacturer	IP	Port	LinkStatus	MachineName	Mode	Status	Current Prog.	PartCount	CycleTime	BusyTime	UtilizationRate
FANUC	192.168.1.13	8193	0	fanuc0i	---	---	---	---	---	---	---
FANUC	192.168.1.12	18193	2	fanuc18i	EDIT	****	O2278	31580	0 : 1 : 43	0.00H	0.00%
MITSUBISHI	192.168.1.10	683	2	M70	MEM	EMG	DEFAULT.PROP	148	0 : 0 : 0	0.00H	0.00%
MITSUBISHI	192.168.1.14	683	0	M90	---	---	---	---	---	---	---
HEIDENHAIN	192.168.1.11	19000	3	Heid-530	MEM	ALARM	drilling.H	0	---	0.00H	0.17%
SIEMENS-OPC	192.168.1.15	4840	0	828D	---	---	---	---	---	---	---

At the bottom of the table area, there are two buttons: 'New' and 'Modify'.

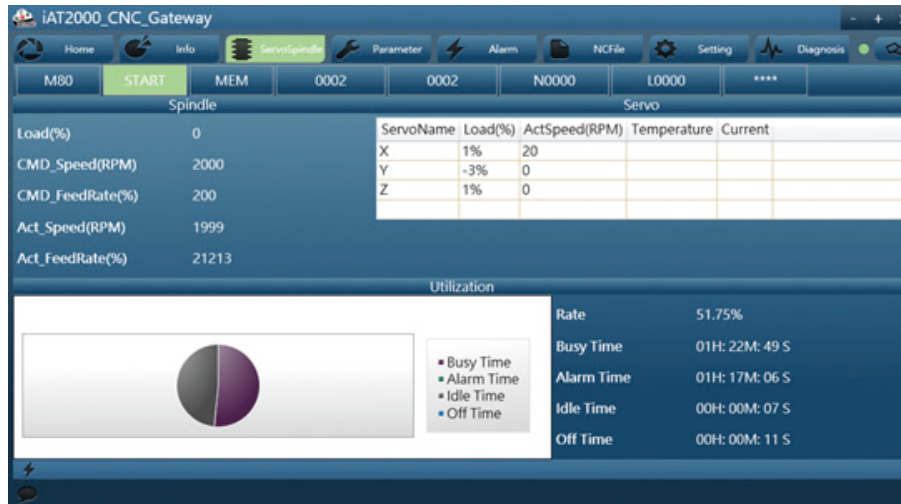
3.2.2 CNC Gateway Page: Info

- Position, CNC status, G Code, Part Count, etc.
- Servo load, Servo speed, Spindle load, Spindle speed, etc.



3.2.3 CNC Gateway Page: ServoSpindle and Utilization

- Servo and Spindle load, Speed, Temperature, etc.
- Daily Utilization Record



3.2.4 CNC Gateway Page: Parameter

- Tool Offset, WorkCoord, Macro and Pocket.

The screenshot shows the 'Parameter' page in the iAT2000 CNC Gateway software. The page has a navigation bar with tabs for Home, Info, ServoSpindle, Parameter (selected), Alarm, NCFfile, and Setting. Below the navigation bar, there are several parameter groups: M70, ****, MEM, CPUACCT.POW ER, CPUACCT.POW ER, N0000, L0000, and ****. The main content is a table with columns for No., Value, No., Value, No., Value, No., Value, No., and Value. The table is divided into sections: Offset, WorkCoord, Macro, and Pocket. A 'Reload' button is visible at the bottom left of the table area.

No.	Value	No.	Value	No.	Value	No.	Value	No.	Value
100	0	101	0	102	0	103	0	104	0
105	0	106	0	107	0	108	0	109	0
110	0	111	0	112	0	113	0	114	0
115	0	116	0	117	0	118	0	119	0
120	0	121	0	122	0	123	0	124	0
125	0	126	0	127	0	128	0	129	0
130	0	131	0	132	0	133	0	134	0
135	0	136	0	137	0	138	0	139	0
140	0	141	0	142	0	143	0	144	0
145	0	146	0	147	0	148	0	149	0
150	0	151	0	152	0	153	0	154	0
155	0	156	0	157	0	158	0	159	0
160	0	161	0	162	0	163	0	164	0
165	0	166	0	167	0	168	0	169	0
170	0	171	0	172	0	173	0	174	0
175	0	176	0	177	0	178	0	179	0
180	0	181	0	182	0	183	0	184	0
185	0	186	0	187	0	188	0	189	0

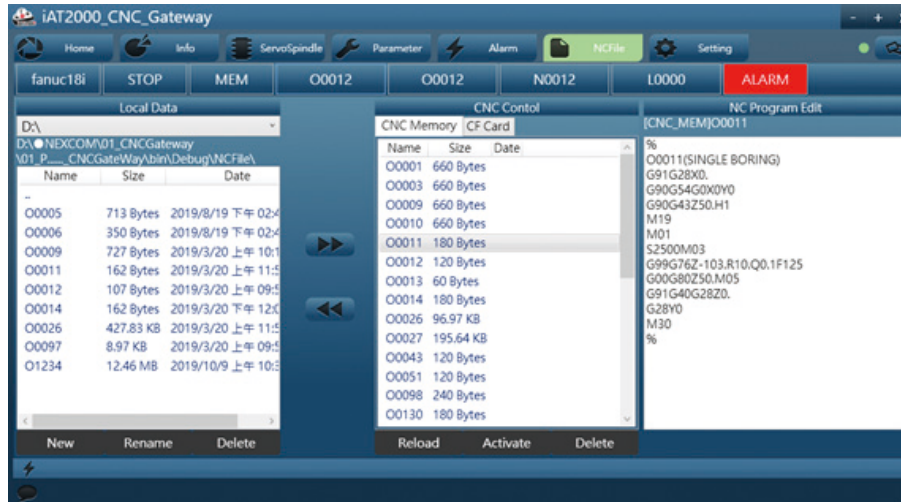
3.2.5 CNC Gateway Page: Alarm

- CurrentAlarm, AlarmRecord and Operation Record.

ErrDate	ErrGroup	ErrClass	ErrNumber	ErrMsg	ErrDescription
2019/07/09 15:56:37	Error	General	418	Program start undefined 22	Cause of error: Error after interruption in program run (with change c Corrective action: Press GOTO select a cycle definition block.
2019/07/09 15:53:07	Emergency.Stop	General	13154	DCM: Tool - Table	Cause of error: Two collision-monitored objects have come below a c <--> Warning - coarse clearance <--> Warning - fine clearance Corrective action: Acknowledge the error message with the CE key and
2019/07/09 15:52:34	Emergency.Stop	General	13154	DCM: Tool - Table	Cause of error: Two collision-monitored objects have come below a c <--> Warning - coarse clearance

3.2.6 CNC Gateway Page: NCFile

- NC File list, Upload File, Active Program, etc.

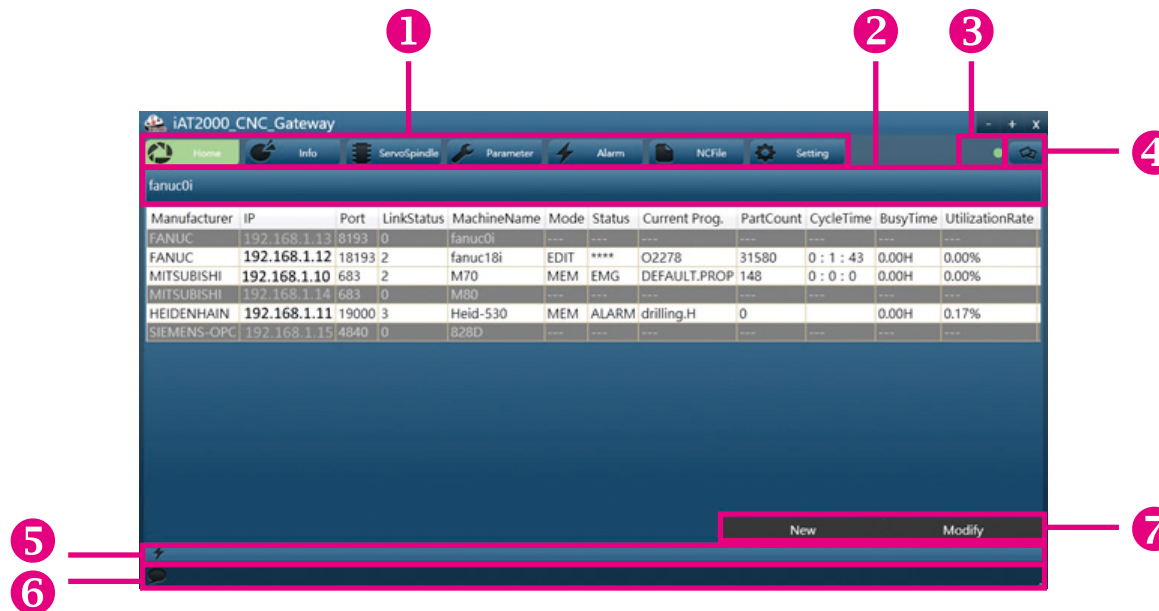


3.2.7 CNC Gateway Page: Setting

- Version, Language, Database Settings, etc.



3.3 Launch CNC Gateway Utility



Item No.	Description
1	Menu page buttons for checking machine information.
2	The name of the selected machine.
3	CNC Agent link status light. Red: No connection / Green: Connection is successful
4	Switch the selected machine.
5	Machine alarm and hit message.
6	Operation message.
7	Machine manager buttons for adding, modifying and deleting machines.

3.4 Set Up a Machine on CNC Gateway

MachineSetting Section

Double-click the machine on the Home page (or click the **New** button to set up a new machine) and open the machine system edit interface. You can set up settings such as machine CNC type, name, IP and port information.

Reminder

1. The CNCTYPE of your controller needs to be defined first. You can type **s** or **f** and it will automatically display **SIEMENS-OPC** or **FANUC** respectively through the autocomplete feature. Change the other settings in the table according to your CNC type.
2. Two or more of the same MachineName cannot be repeated in the list.
3. When setting up a Siemens controller. The **OPCUserName** and **OPCPassword** fields need to be configured.

MachineSetting		MachineAPI	
Items	Value	Items	Value
CNCTYPE	SIEMENS-OPC	GET_information	Cycle
CONTROLLER	828D	GET_information_heid	Cycle
MachineName	828D	GET_status	Cycle
IP	192.168.1.1	GET_position	Cycle
PORT	4840	GET_gcode	Cycle
IsFTP	False	GET_othercode	Cycle
FTPUSER	manufact	GET_feed_spindle	Cycle
FTPPWD	SUNRISE	GET_time	Cycle
OPCUserName	pmc	GET_time_heid	Cycle
OPCPassword	pmc	GET_time_cnc	Cycle
NCFilePath	/nckfs/_N_MPF_DIR	GET_part_count	Cycle
CFFilePath	/card/user/sinumerik/data/mnt/usercf	GET_part_total	None
AlmLogPath	/user/sinumerik/hmi/log/alarm_log/alarmlog.txt	GET_part_required	None
		GET_alm_current	None
		GET_alm_current2	Cycle

Automatically update the program after adding/modifying the machine API

Delete Save Back

MachineAPI Section

The CNC Gateway can control the **GET_** parameter information, you can set either the **Cycle**, **None** or **Once** value on your MachineAPI. For example, the data on the CNC for **Get_alm_history** contains large amounts of data, if you set the API value to **Cycle**, the PC, network connection and CNC may become busy. Alternatively, you can set any unused API values to **None**, which will release resources and improve system efficiency.

CHAPTER 4: CNC GATEWAY SQL FUNCTION

4.1 Default SQL Database Information on CNC Gateway (Check Setting Page of CNCGateway)

Hostname/IP	localhost
IP Address	127.0.0.1
Port Number	3306
Database Name	iat2000_cnc_gateway
Username	root
Password	cncgateway
Encode Type	UTF-8

4.2 SQL Database Sheet

Sheet Name	Description	Page
alm_current	Current alarm of all machines, data contains: message, code, class, etc.	36
alm_current_heid	Current alarm of the Heidenhain machine, if the machine's manufacturer is not Heidenhain, the table will be empty.	36
cncgateway_errorlist	The CNCGateway error list.	36
cncgateway_loglist	The CNCGateway log list.	36
feed_spindle	Feed and spindle information of all the machines, data contains: override feed, override spindle, actual feed and actual spindle.	36
gcode	G code of all the machines.	36

Sheet Name	Description	Page
information	Information of all the machines, data contains: number of controlled axes, cnc type, number of max axes, etc.	37
information_heid	Information of the Heidenhain machine, if the machine's manufacturer is not Heidenhain, the table will be empty. [N] is machine index of list.	37
machineN_alm_history	Alarm history of the machine, data contains: message, code, time. [N] is machine index of list.	37
machineN_alm_history_heid	Alarm history of the Heidenhain machine, if the machine's manufacturer is not Heidenhain, the table will be empty. [N] is machine index of list.	37
machineN_macro	Macro data list of the machines, [N] is machine index of list.	38
machineN_msg_history	Operation history of the Fanuc machine, data contains: message, time. [N] is machine index of list.	38
machineN_nc_ftp_list	FTP program list of the machines, data contains: name, time, size, etc. [N] is machine index of list.	38
machineN_nc_mem_list	MEM program list of the machines, data contains: name, time, size, etc. [N] is machine index of list.	38
machineN_offset	Offset data or tool table, [N] is machine index of list.	38
machineN_plc_alarm	PLC alarm of the machine, [N] is machine index of list.	39
machineN_pocket_heid	Pocket data of the Heidenhain machine, [N] is machine index of list.	39
machineN_utilization	Utilization data of the machine, [N] is machine index of list.	39

Sheet Name	Description	Page
machineN_workcoord	WorkCoord or datum data of the machine, [N] is machine index of list.	39
machinelist	Machine list of all the connections, data contains: CNC Type, IP, Port, Link status, machine name, CNC status, current program, part count, cycle time and busy time.	40
msg_current	Current alarm of all the machines, data contains: message, code, class, etc.	40
othercode	H Code, D Code, T Code, M Code, B Code, F Code, S Code, etc.	40
part_count	Part count of all the machines.	41
part_required	Part required of all the machines. Only FANUC has this item.	41
part_total	Part total of all the machines. Only FANUC has this item.	41
position	Position of all the machines, data contains: unit, machine, absolute, relative and distance coordinates. Heidenhain doesn't have relative position.	41
prog_action	Fill in the machine name, program name, action code and so forth to this table. The database command can modify program in this table. More information at O Program Action.	41
reload_table	Fill in the machine name, action string or table name and you can use action to update all the information.	41
servo_current	Servo currents of all the machines, only FANUC has this item.	42
servo_load	Servo load of all the machines.	42
servo_speed	Servo speed of all the machines.	42

Sheet Name	Description	Page
servo_temperature	Servo temperature of all the machines.	42
spindle_load	Spindle load of all the machines.	42
spindle_speed	Spindle speed of all the machines.	42
spindle_temperature	Spindle temperature of all the machines.	42
status	Status of all the machines, data contains: main and current program, current line, mode, status and alarm.	43
status_prog	Running program status of all the machines, data contains: current block (255 characters), current program name, main program name, current line number and block pointer.	43
time	Power time, cutting time, cycle time and operation time of all the machines. The format is [hour, min, sec]. Mitsubishi doesn't have cutting time.	43
time_cnc	Machine system time of all the machines. The format is [hour, min, sec]. Heidenhain doesn't have this item.	43
time_heid	Machine running, machine up, NC up and spindle running time of the Heidenhain machine.	44
utilization_today	Busy, idle, alarm, off total time and part total of all the machines on today.	44
write_macro	Fill in the machine name, macro number and value to this table. The database command can modify macro in this table.	44
write_offset	Fill in the machine name, offset number and value to this table. The database command can modify offset in this table.	44
write_workcoord	Fill in the machine name, work coordinates and value to this table. The database command can modify work coordinates in this table.	44

4.3 SQL Function

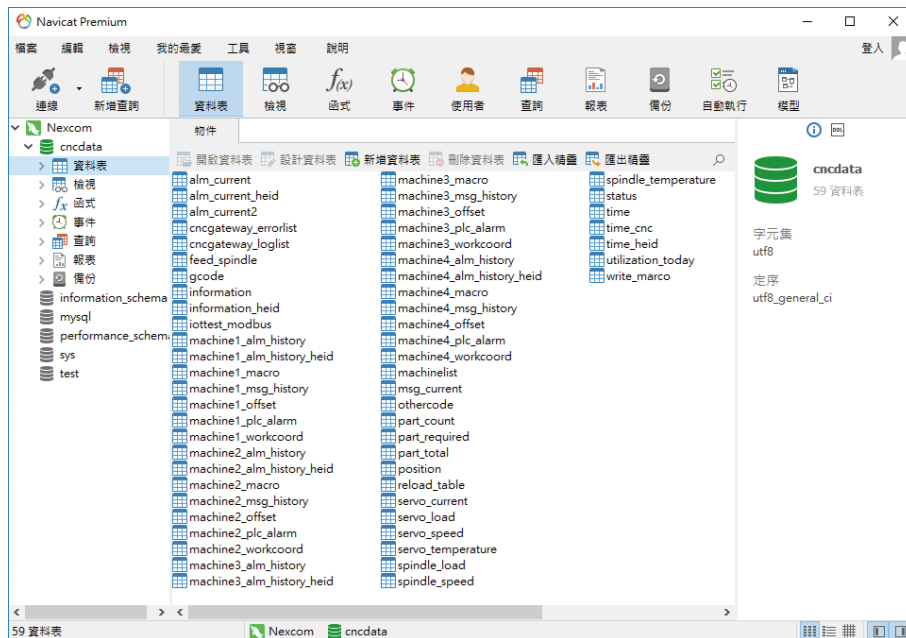
4.3.1 Write Command to [reload_table]

MachineName	TableName	Description
all / MachineName	read_macro	[MachineName] is "all", update all machine macro in the list. [MachineName] is one machine in the list that will be updated with the machine macro.
all / MachineName	read_workcoord	As above
all / MachineName	read_offset	As above
all / MachineName	read_almhhistory	As above
all / MachineName	read_msghistory	As above
all / MachineName	read_ncmemList	As above
all / MachineName	read_ncftpList	As above
all / MachineName	read_all_cycle	Set all data to automatically update in cycle time.
all / MachineName	read_all_once	Set all data to automatically update once.
all / MachineName	close_all_cycle	Set all data to close cycle update.

MachineName	TableName	Description
MachineName	write_macro	Update the macro of [write_macro] so that the MachineName Column is the same with machine name.
MachineName	write_offset	Update the offset of [write_offset] so that the MachineName Column is the same with machine name.
MachineName	write_workcoord	Update the workcoord of [write_workcoord] so that the MachineName Column is the same with machine name.
MachineName	prog_action	According to the command of the [prog_action] table, upload/download/delete the CNC program and set the CNC main program. More information at 0 Program Action.

4.3.2 Example: Write Macro

1. When the program starts, it will automatically create the tables [write_macro] and [cncgateway_errorlist] to the database.



2. Write the MachineName, Number, and Value to [write_macro].

The screenshot shows the 'write_macro' table in the 'cncdata' database. The table has three columns: 'MachineName', 'Number', and 'Value'. The data is as follows:

MachineName	Number	Value
fanuc0i	500	500
fanuc18i	506	506
fanuc18i	507	507
fanuc18i	508	508

3. Write the MachineName, TableName and TimeStamp to [reload_table], it will activate the updated action. (The TimeStamp cannot be null, or you can input a space character to TimeStamp instead). iAT2000_CNCGateway will be updated based on [write_macro].

物件 reload_table @cncdata (Nex...)

開始交易 文字 篩選 排序 匯入 匯出

MachineName	TableName	TimeStamp
fanuc18i	write_macro	
all	read_marco	2018/12/19 下午 05:47:20
fanuc18i	read_offset	2018/12/19 下午 05:55:20

iAT2000_CNC_Gateway

Home Info ServoSpindle Parameter Alarm NCFile Setting

fanuc18i **** MEM O0097 O0097 N0019 L0002 ****

	No.	Value	No.	Value	No.	Value	No.	Value	No.	Value
Offset	172	0	173	0	174	0	175	0	176	0
	177	0	178	0	179	0	180	0	181	0
	182	0	183	0	184	0	185	0	186	0
	187	0	188	0	189	0	190	0	191	0
	192	0	193	0	194	0	195	0	196	0
	197	0	198	0	199	0	500	0	501	0
	502	0	503	10	504	0	505	0	506	506
	507	507	508	508	509	509	510	1	511	0
	512	0	513	0	514	0	515	0	516	0
	517	5170	518	5180	519	519	520	0	521	0
	522	0	523	0	524	0	525	0	526	0
	527	0	528	0	529	0	530	0	531	0
	532	0	533	0	534	0	535	0	536	0
	537	0	538	0	539	0	540	0	541	0
	542	0	543	0	544	0	545	0	546	0
	547	0	548	5	549	0	550	0	551	0
	552	0	553	0	554	0	555	0	556	0
	557	0	558	0	559	0	560	52	561	0
	562	0	563	0	564	0	565	0	566	0

4. If you receive an error during writing, you can find the error message in [cncgateway_errorlist].

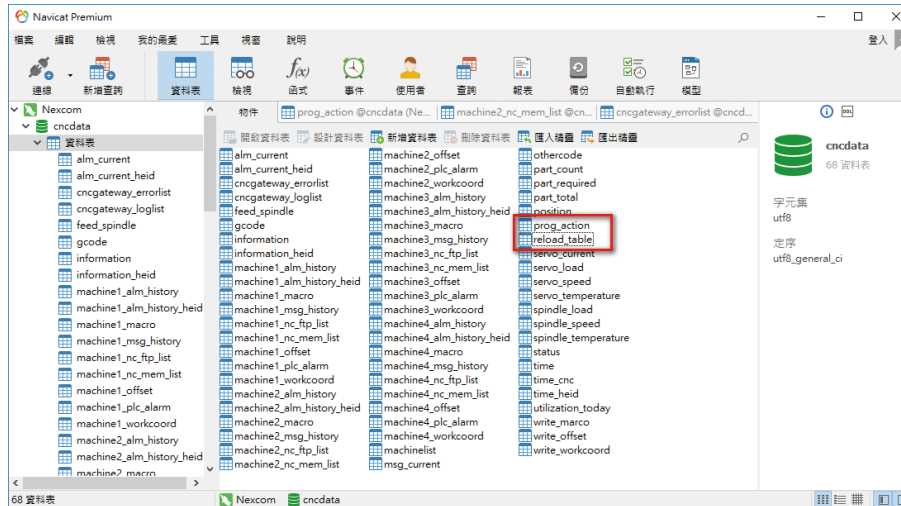
TimeStamp	Message
10/08/2018 09:4	[Write Marco Failed]DeviceName=fanc0i Number = 10 MacroData = 10 ret=7
10/08/2018 09:4	[Write Marco Failed]DeviceName=fanc0i Number = 5 MacroData = 55 ret=7
10/08/2018 09:4	[Write Marco Failed]DeviceName=fanc0i Number = 9 MacroData = 99 ret=7
10/08/2018 10:1	[Write Marco Failed]DeviceName=fanc0i Number = 1 MacroData = 11 ret=7
10/08/2018 10:1	[Write Marco Failed]DeviceName=fanc0i Number = 6 MacroData = 66 ret=7
10/08/2018 10:1	[Write Marco Failed]DeviceName=fanc0i Number = 77 MacroData = 77 ret=7
10/08/2018 03:4	[Write Marco Failed]DeviceName=fanc0i Number = 508 MacroData = 508 ret=-16
10/08/2018 03:4	[Write Marco Failed]DeviceName=fanc0i Number = 508 MacroData = 508 ret=-16

4.3.3 Program Action

Column	Description
MachineName	The name of the activated machine.
NcName	CNC program name (includes extension).
ProgComman	Program command code. 1: Download from CNC MEM 2: Upload to CNC MEM 3: Delete from CNC MEM 4: Download from CNC FTP 5: Upload to CNC FTP 6: Delete from CNC FTP 7: Upload to CNC MDI 8: Set CNC main program
ProgParh	If the program command is downloading, [ProgParh] will be the CNC file download folder path and [NcName] will be the name of the CNC program. If the program command is uploading, [ProgParh] will be the upload file folder path and [NcName] will be the upload file name. If [ProgParh] is empty, [ProgParh] is the default path [C:\iAT2000_CNC_Gateway\NCFile];

4.3.4 Example: Download CNC MEM Program

1. Check if the tables [reload_table] and [prog_action] are available.



- Write the MachineName, NcName, ProgComman (command code) and ProgPath (program path) to [prog_action]. [progpah] defines that the download file path will be on the local disk.

MachineName	NcName	ProgComman	ProgPath
M70	O0003	1	D:\
M70	O0008	1	D:\
M70	O9999	3	D:\

- Write the MachineName, TableName and TimeStamp to [reload_table]. It will activate the Program action. (The TimeStamp cannot be null, or you can input a space character to TimeStamp instead). iAT2000_CNCGateway will be updated based on [prog_action].

MachineName	TableName	TimeStamp
M70	prog_action	
M70	read_ncmemList	

名稱	修改日期	類型	大小
●NEXCOM	2018/12/11 下午 ...	檔案資料夾	
Ling	2018/12/21 下午 ...	檔案資料夾	
mail	2018/12/26 下午 ...	檔案資料夾	
MIS	2018/9/27 下午 0...	檔案資料夾	
工具箱	2018/10/31 下午 ...	檔案資料夾	
O0003	2018/12/26 下午 ...	檔案	1 KB
O9999	2018/12/26 下午 ...	檔案	1 KB

4. If you receive an error during writing, you can find the error message in [cncgateway_errorlist].

cncgateway_errorlist @cncdata (Nexcom) - 資料庫 - Navicat Premium

檔案 編輯 檢視 資料庫 我的最愛 工具 視窗 說明

連線 新增查詢 資料庫 檢視 函式 事件 使用者 查詢 報表 備份 自動執行 模型

物件 prog_action @cncdata (Nex... cncgateway_errorlist @cncda... reload_table @cncdata (Nex...

TimeStamp	Message
2018-12-26 03:31:13	[S]Error msg from M80_GET_ncftp_list: 1
2018-12-26 03:31:42	[S]Error msg from fanuc18i_GET_time_cnc: -1
2018-12-26 03:31:29	[S]Error msg from M70_GET_ncftp_list: 1
2018-12-26 03:31:55	[ProgAction Failed]!MachineName=M70, NcName = O0008, ProgComman = 1, ret=1
2018-12-26 03:39:05	[S]Error msg from M70_GET_othercode: 1
2018-12-26 03:39:06	[S]Error msg from M70_GET_feed_spindle: 1
2018-12-26 03:39:06	[S]Error msg from M70_GET_spindle_load: 1
2018-12-26 03:39:06	[S]Error msg from M70_GET_spindle_speed: 1
2018-12-26 03:39:07	[S]Error msg from fanuc18i_GET_plc_alarm: -6
2018-12-26 03:39:10	[S]Error msg from fanuc18i_GET_spindle_load: 6
2018-12-26 03:39:12	[S]Error msg from fanuc18i_GET_ncftp_list: 14
2018-12-26 03:39:23	[S]Error msg from fanuc18i_GET_time_cnc: -1
2018-12-26 03:39:28	[S]Error msg from M80_GET_ncftp_list: 1
2018-12-26 03:39:51	[S]Error msg from fanuc18i_GET_plc_alarm: -6
2018-12-26 03:39:52	[S]Error msg from fanuc18i_GET_spindle_load: 6
2018-12-26 03:39:53	[S]Error msg from M70_GET_othercode: 1
2018-12-26 03:39:53	[S]Error msg from M70_GET_feed_spindle: 1

4.4 Error Code Description

Error Code	Error Class	Description
-999	Error (Disconnect)	There is no connection with the CNC Agent.
-995	Error (Function Mismatch)	There is no matching function when the program is running.
-990	Error	Undefined error.
-901	Error (No Definition)	The data has not been defined when running the function.
-902	Error (Write File)	An error occurred while writing file.
-903	Error (Read File)	An error occurred while reading file.
-904	Error (No Error Code)	Analysis of the response to the problem.
-905	Error (File in Use)	The file to be written is in use.
-31	Camera Exception	Camera has an internal exception error.
-30	Camera Current Running	Camera is currently connected and capturing image.
-29	Camera Disconnect	Camera is not connected.
-28	RS-232 Close	The RS-232 COM port is turned off.
-27	RS-232 Over Limit	The RS-232 connection module has exceeded the upper limit.
-26	RS-232 Return Type	Please specify the type returned by RS-232.
-25	RS-232 Open Failed	The RS-232 COM port has failed to turn on or has been turned on.
-24	RS-232 Exception	RS-232 exception. Please use the corresponding function to get the error.
-23	Sensor Exception	The sensor module or API experienced an error. Please use the corresponding function to get the error.
-22	Sensor Current Running	The sensor is currently being executed.
-21	USB Key Error	USB key failure (hardware lock failure).
-20	Plug-in Timeout	The function executed has timed out. If you want to lengthen it, please modify the register directly.
-19	CNC Agent Busy	CNC Agent is currently being launched.
-18	Not Supported	The controller does not support this function.
-17	Protocol Error (Ethernet Version Only)	The network card settings are incorrect.
-16	Socket Error (Ethernet Version Only)	The connection failed or the controller refused to connect.
-15	DLL File Error	The CNC model does not correspond to the DLL or the DLL file has been lost.
-8	Handle Number Error	Please get the handle value.

Error Code	Error Class	Description
-7	Version mismatch between the CNC/PMC and library	The CNC/PMC version cannot be used for the library. Please replace the library or update the CNC/PMC control software.
-6	Abnormal Library State	An exception error occurred in the library.
-3	Random Key Timeout	The random key expired. Please retry the random key.
-2	Reset or Stop Request	The reset or stop button is pressed. The function was aborted.
-1	CNC Busy	The CNC is busy, please try again later.
0	Normal Termination	Normal state, no error occurred.
1	Error (Function is not executed, or not available)	Please execute a specific function before you use it.
2	Error (Data Block Length Error, Data Number Error)	Check the information on the number and length information.
3	Error (Data Number Error)	Please check if the data number is correct.
4	Error (Data Attribute Error)	Please check if the property information is correct.
5	Error (Data Error)	Written incorrectly.
6	Error (No Option)	CNC did not purchase this function.
7	Error (Write Protection)	Write protection.
8	Error (Memory Overflow)	Memory overflows.
9	Error (CNC Parameter Error)	The parameter setting is incorrect.
10	Error (Buffer Empty/Full)	The buffer is empty or full.
11	Error (Path Number Error)	The path is incorrect.
12	Error (CNC Mode Error)	The CNC Mode is incorrect.
13	Error (CNC Execution Rejection)	The CNC refused to execute.
14	Error (Data Server Error)	An error occurred in the data server.
15	Error (Alarm)	An error occurred in alert handling.
16	Error (Stop)	The CNC status is stopped or in emergency.
17	Error (State of Data Protection)	The information is protected by the CNC.
18	Error (Machine ID Not Found)	The machine cannot connect.
19	Error (No Out)	Please confirm NO.
20	Error (Password)	Wrong password.
21	Error (Compatible)	Compatibility issues. (Unable to match the old API).

4.5 SQL Data Table

Tables	Field	Type	Key	Description
alm_current	MachineName	varchar(45)	PRI	Name of the machine.
	TimeStamp	datetime		Time of record.
	IsAlarm	tinyint(1)		Alarm status.
	AlmClassArray	varchar(255)		Alarm class of all the alarms, use [,] to split.
	AlmCodeArray	varchar(255)		Alarm code of all the alarms, use [,] to split.
	AlmMsgArray	mediumtext		Alarm message of all the alarms, use [,] to split.
alm_current_heid	MachineName	varchar(45)	PRI	Name of the machine.
	TimeStamp	datetime		Time of record.
	IsAlarm	tinyint(1)		Alarm status.
	ErrNumberArray	varchar(45)		Alarm number of all the alarms, use [,] to split.
	ErrGroupArray	varchar(255)		Alarm group of all the alarms, use [,] to split.
	ErrClassArray	varchar(255)		Alarm class of all the alarms, use [,] to split.
	ErrMsgArray	mediumtext		Alarm message of all the alarms, use [,] to split.
	ErrDescriptionArray	mediumtext		Alarm description of all the alarms, use [,] to split.
cncgateway_errorlist	TimeStamp	datetime		Time of record.
	Message	text		Message of gateway error.
cncgateway_loglist	TimeStamp	datetime		Time of record.
	Message	text		Message of gateway log.
feed_spindle	MachineName	varchar(45)	PRI	Name of the machine.
	TimeStamp	datetime		Time of record.
	ActFeed	double		Actual federate.
	ActSpindle	int(11)		Actual spindle RPM.
	OvFeed	double		FeedRate override.
	OvSpindle	double		Spindle override.
gcode	MachineName	varchar(45)	PRI	Name of the machine.
	TimeStamp	datetime		Time of record.
	GdataArray	varchar(20000)		G code list, use [,] to split.

Tables	Field	Type	Key	Description
information	MachineName	varchar(45)	PRI	Name of the machine.
	TimeStamp	datetime		Time of record.
	Axes	int(11)		Enable count of axes.
	AxisNameArray	varchar(255)		Enable number of axes, use [,] to split.
	CncType	varchar(45)		Product number of CNC.
	MaxAxes	int(11)		Maximum count of axes.
	Nc_Ver	varchar(45)		NC versions.
	Series	varchar(45)		Types of CNC, such as milling, turning, etc.
information_heid	MachineName	varchar(45)	PRI	Name of the machine.
	TimeStamp	datetime		Time of record.
	Axes	int(11)		Enable count of axes.
	AxisNameArray	varchar(255)		Enable number of axes, use [,] to split.
	FCL	varchar(45)		
	Model	varchar(45)		
	Nc_Ver	varchar(45)		NC versions.
	Plc_Ver	varchar(45)		PLC versions.
machineN_alm_history	MachineName	varchar(45)		Name of the machine.
	TimeStamp	datetime	PRI	Time of record.
	AlmClass	varchar(45)		Alarm class.
	AlmCode	varchar(45)		Alarm code.
	AlmDate	varchar(255)		Alarm date time.
	AlmMsg	varchar(1024)		Alarm message.
machineN_alm_history_heid	MachineName	varchar(45)	PRI	Name of the machine.
	TimeStamp	datetime		Time of record.
	ErrNumber	int(11)		Alarm number.
	ErrGroup	varchar(45)		Alarm group.
	ErrClass	varchar(45)		Alarm class.
	ErrMsg	varchar(255)		Alarm message.
	ErrDescription	text		Alarm description.
	ErrDate	varchar(255)		Alarm date.

Tables	Field	Type	Key	Description
machineN_macro	MachineName	varchar(45)		Name of the machine.
	TimeStamp	datetime		Time of record.
	Number	int(11)	PRI	Macro number.
	Value	double		Macro value.
machineN_msg_history	MachineName	varchar(45)		Name of the machine.
	TimeStamp	datetime		Time of record.
	MsgCode	smallint(6)		Operation code.
	MsgDate	varchar(255)	PRI	Operation date and time.
	MsgText	varchar(255)		Operation message.
machineN_nc_ftp_list	MachineName	varchar(45)		Name of the machine.
	TimeStamp	datetime		Time of record.
	NcName	varchar(45)	PRI	Name of the FTP programs.
	Size	int(11)		Size (byte) of the FTP programs.
	DateTime	varchar(255)		Date and time of the FTP programs.
	FD	varchar(45)		Data type, file or directory.
machineN_nc_mem_list	MachineName	varchar(45)		Name of the machine.
	TimeStamp	datetime		Time of record.
	NcName	varchar(45)	PRI	Name of the memory programs.
	Size	int(11)		Size (byte) of the memory programs.
	DateTime	varchar(255)		Date and time of the memory programs, it is dependent on the brand.
	Remark	varchar(45)		Remark of the memory programs, it is dependent on the brand.
	FD	varchar(45)		Data type, file or directory.
machineN_offset	MachineName	varchar(45)		Name of the machine.
	TimeStamp	datetime		Time of record.
	ColumnCount	tinyint(4)		Offset type count.
	ColumnName	varchar(512)		Name of Offset type, use [,] to split.
	Number	int(11)	PRI	Offset number.

Tables	Field	Type	Key	Description
machineN_offset	Column1~10	varchar(255)		The contents of Column 1 to 10 are sorted in the order of first to last in [ColumnName]. For example: ColumnName= [LENGTH GEOM, LENGTH WEAR, RADIUS GEOM, RADIUS WEAR], then the columns would be in the following order: Column1= LENGTH GEOM Column2= LENGTH WEAR Column3= RADIUS GEOM Column4= RADIUS WEAR
machineN_plc_alarm	MachineName	varchar(45)		Name of the machine.
	TimeStamp	datetime		Time of record.
	AlmMsg	varchar(255)		Description of the PLC alarm.
machineN_pocket_heid	MachineName	varchar(45)		Name of the machine.
	TimeStamp	datetime		Time of record.
	ColumnCount	tinyint(4)		Offset type count.
	ColumnName	varchar(512)		Name of the Offset type, use [,] to split.
	Number	int(11)	PRI	Offset number.
	Column1~25	varchar(255)		The contents of Column 1 to 25 are sorted in the order of first to last in [ColumnName]. For example: ColumnName=[T,ST,F,L,PLC,TNAME,DOC...], then the column order would be Column1=T, Column2=S and so on.
machineN_utilization	MachineName	varchar(45)		Name of the machine.
	TimeStamp	datetime	PRI	Time of record.
	AlarmTotal	double		Total alarm time today.
	BusyTotal	double		Total running time today.
	CycleTotal	int(11)		Total number of cycles today.
	IdleTotal	double		Total idle time today.
	OffTotal	double		Total power on time today.
	PartTotal	int(11)		Total number of parts today.
machineN_workcoord	MachineName	varchar(45)		Name of the machine.
	TimeStamp	datetime		Time of record.
	ColumnCount	tinyint(4)		Offset type count.
	ColumnName	varchar(255)		Name of work coordinates, use [,] to split.
	CoordName	varchar(45)	PRI	Work coordinates name.

Tables	Field	Type	Key	Description
machineN_workcoord	Column1~10	varchar(255)		The contents of Column1 to 10 are sorted in the order of first to last in [ColumnName]. For example: ColumnName= [X,Y, Z], then the column order would be Column1= X, Column2= Y, Column3= Z.
machinelist	TimeStamp	datetime		Time of record.
	Manufacturer	varchar(45)		Manufacturer of the machine.
	IP	varchar(45)		IP address of the machine.
	Port	varchar(45)		IP port of the machine.
	LinkStatus	int(11)		Line status of the machine.
	MachineName	varchar(45)	PRI	Name of the machine.
	Mode	varchar(45)		CNC mode of the machine.
	Status	varchar(45)		CNC status of the machine.
	CurProg	varchar(45)		Current program of the machine.
	PartCount	varchar(45)		Part count of the machine.
	CycleTime	varchar(45)		Cycle time of the machine.
	BusyTime	varchar(45)		Busy time of the machine.
	UtilizationRate	varchar(150)		Utilization rate of the machine.
MachineIndex	Tinyint(244)		Index of the machine.	
msg_current	MachineName	varchar(45)	PRI	Name of the machine.
	TimeStamp	datetime		Time of record.
	IsMsg	tinyint(1)		Status of the current operation message.
	MsgCode	smallint(6)		Code of the current operation.
	MsgText	varchar(255)		Context of the current operation.
othercode	MachineName	varchar(45)	PRI	Name of the machine.
	TimeStamp	datetime		Time of record.
	BCode	int(11)		B Code. It is dependent on Mitsubishi.
	DCode	int(11)		D Code. Heidenhain doesn't have this item.
	FCode	int(11)		F Code
	HCode	int(11)		H Code. Heidenhain doesn't have this item.
	MCode	int(11)		M Code
	SCode	int(11)		S Code
TCode	int(11)		T Code	

Tables	Field	Type	Key	Description
part_count	MachineName	varchar(45)	PRI	Name of the machine.
	TimeStamp	datetime		Time of record.
	PartCount	int(11)		Part count of the machine.
part_required	MachineName	varchar(45)	PRI	Name of the machine
	TimeStamp	datetime		Time of record.
	PartRequired	int(11)		Part required of the machine.
part_total	MachineName	varchar(45)	PRI	Name of the machine.
	TimeStamp	datetime		Time of record.
	PartTotal	int(11)		Part total of the machine.
position	MachineName	varchar(45)	PRI	Name of the machine.
	TimeStamp	datetime		Time of record.
	AbsArray	varchar(255)		Absolute coordinates list, use [,] to split. The contexts are sorted in the order of first to last in [AxisNameArray].
	AxisNameArray	varchar(255)		Enable the number of axes, use [,] to split.
	DecPoint	int(11)		Coordinate decimal point.
	DistArray	varchar(255)		Remaining distance coordinates list, use [,] to split. The contexts are sorted in the order of first to last in [AxisNameArray].
	MachArray	varchar(255)		Mechanical coordinate list, use [,] to split. The contexts are sorted in the order of first to last in [AxisNameArray].
	RelArray	varchar(255)		Relative coordinate list, use [,] to split. The contexts are sorted in the order of first to last in [AxisNameArray].
prog_action	UnitArray	varchar(255)		Coordinate unit for each axis.
	MachineName	varchar(100)		Name of the machine.
	NcName	varchar(100)	PRI	Name of the program that will be operated.
	ProgComman	int(11)		Command number.
reload_table	ProgPath	text		The local path of the program to upload or download to.
	MachineName	varchar(45)	PRI	Name of the machine.
	TableName	text		Table name or command.
	TimeStamp	text		Action time of the record.

Tables	Field	Type	Key	Description
servo_current	MachineName	varchar(45)		Name of the machine.
	TimeStamp	datetime		Time of record.
	AxisCurrentArray	varchar(255)		Servo current list, use [,] to split. The contexts are sorted in the order of first to last in [AxisNameArray].
servo_load	MachineName	varchar(45)	PRI	Name of the machine.
	TimeStamp	datetime		Time of record.
	ServoLoadPercentArray	varchar(255)		Servo load list, use [,] to split. The contexts are sorted in the order of first to last in [AxisNameArray].
servo_speed	MachineName	varchar(45)	PRI	Name of the machine.
	TimeStamp	datetime		Time of record.
	ServoSpdArray	varchar(255)		Servo speed list, use [,] to split. The contexts are sorted in the order of first to last in [AxisNameArray].
servo_temperature	MachineName	varchar(45)	PRI	Name of the machine.
	TimeStamp	datetime		Time of record.
	AxisTempArray	varchar(255)		Servo temperature list, use [,] to split. The contexts are sorted in the order of first to last in [AxisNameArray]. It is dependent on Fanuc.
spindle_load	MachineName	varchar(45)	PRI	Name of the machine.
	TimeStamp	datetime		Time of record.
	SpLoad	double		Spindle load.
spindle_speed	MachineName	varchar(45)	PRI	Name of the machine.
	TimeStamp	datetime		Time of record.
	SpSpeed	int(11)		Spindle speed.
spindle_temperature	MachineName	varchar(45)	PRI	Name of the machine.
	TimeStamp	datetime		Time of record.
	Spindle_1_Temp	double		First spindle temperature.
	Spindle_2_Temp	double		Second spindle temperature.

Tables	Field	Type	Key	Description
status	MachineName	varchar(45)	PRI	Name of the machine.
	TimeStamp	datetime		Time of record.
	Alarm	varchar(45)		Alarm status, [Alarm] or [****].
	CurProg	varchar(45)		Current program.
	CurSeq	int(11)		Current sequence N line number.
	Emg	varchar(45)		Emergency stop, [EMG] or [****].
	MainProg	varchar(45)		Main program.
	Mode	varchar(45)		CNC mode of the machine.
	Status	varchar(45)		CNC status of the machine.
	BlkPointer	varchar(45)		Current program line number.
status_prog	MachineName	varchar(45)	PRI	Name of the machine.
	TimeStamp	datetime		Time of record.
	CurrentBlock	varchar(512)		The existing section of the CNC is only reading 256 characters in length.
	CurProg	varchar(45)		Current program.
	MainProg	varchar(45)		Main program.
	CurSeq	int(11)		Current sequence N line number.
	BlkPointer	varchar(45)		Current program line number.
time	MachineName	varchar(45)	PRI	Name of the machine.
	TimeStamp	datetime		Time of record.
	CuttingArray	varchar(255)		Cutting time of the machine, format is [hh,mm,ss].
	CycleArray	varchar(255)		Cycle time of the machine, format is [hh,mm,ss].
	OperationArray	varchar(255)		Operation time of the machine, format is [hh,mm,ss].
	PowerArray	varchar(255)		Power time of the machine, format is [hh,mm,ss].
time_cnc	MachineName	varchar(45)	PRI	Name of the machine.
	TimeStamp	datetime		Time of record.
	SystemTimeArray	varchar(255)		Operation time of the machine, format is [yyyy,mm,dd,hh,mm,ss].

Tables	Field	Type	Key	Description
time_heid	MachineName	varchar(45)	PRI	Name of the machine.
	TimeStamp	datetime		Time of record.
	MachineRunningArray	varchar(255)		Cumulative machining time since installation.
	MachineUpArray	varchar(255)		Cumulative time that the machine has been on (no emergency stop) since installation.
	NcUpArray	varchar(255)		Cumulative time that the NC has been turned on since installation of the machine.
	SpindleRunningArray	varchar(255)		Cumulative time that the spindle has been operating (M3 or M4).
utilization_today	MachineName	varchar(45)	PRI	Name of the machine.
	TimeStamp	datetime		Time of record.
	AlarmTotal	double		Total alarm time today.
	BusyTotal	double		Total running time today.
	CycleTotal	int(11)		Total number of cycles today.
	IdleTotal	double		Total idle time today.
	OffTotal	double		Total power on time today.
	PartTotal	int(11)		Total number of parts today.
write_macro	MachineName	varchar(45)		Name of the machine.
	Number	int(11)		Number of the marco setting.
	Value	double		Value of the macro setting.
write_offset	MachineName	varchar(45)		Name of the machine.
	Number	int(11)		Number of the offset setting.
	ColumnCount	tinyint(4)		Count of the offset value setting.
	C1~10	double		C1~10 are sorted in the order of offset [ColumnName].
write_workcoord	MachineName	varchar(45)		Name of the machine.
	Number	varchar(255)		Number of work coordinates setting.
	ColumnCount	tinyint(4)		Count of work coordinates value setting.
	Axis1~8	double		Axis1~8 are sorted in the order of offset [ColumnName].

APPENDIX A: POWER CONSUMPTION

Power Consumption Management

Purpose

The purpose of the power consumption test is to verify the power dissipation of system, and the loading of power supply.

Test Equipment

PROVA CM-07 AC/DC CLAMP METER

Device Under Test

DUT: NISE 105

CPU: Intel Atom® processor E3826 dual core, 1.46GHz

Memory: DDR3L SO-DIMM 4GB Samsung Transcend (TS512MSK64W6H)

HDD: SSD 2.5" SATA3 128GB Transcend (TS128GSSD420K)

CFast: Transcend CFast 32GB (TS32GCFX500I)

Power Supply: Laboratory DC Power Supply GWINSTEK GPC-60300

Add-on Card: Mini PCIe Card 8790V

CPU Cooler: NISE 105 CPU Heatsink SHYUNG SHUHN

System Fan: N/A

Keyboard: Microsoft Wired Keyboard 600

Mouse: Microsoft Basic Optical Mouse

Test Procedure

1. Power up the DUT, boot into Windows 7 x64 Pro2.
2. Entering standby mode (HDD power down).
3. Measure the power consumption and record it.
4. Run Burn-in test program to apply 100% full loading.
5. Measure the power consumption and record it.

Test Data

	Sys #1	Sys #1
	+12V	+24V
Full-Loading Mode	2.03A	1.11A
Total	24.36W	26.64W
Standby S3 Mode	0.93A	0.49A
Total	11.16W	11.76W

APPENDIX B: VERSION HISTORY

Item	Description	Update Date	Guide Version	CNC Gateway Version
1	First edition	2019/1/2	Ver. 1.0	1.0.1
2	Update with Ver 1.0.4	2019/10/17	Ver. 2.0	1.0.4