

The header features a solid green background on the left and a pattern of white circuit lines on the right. Several circular icons are overlaid on the circuit pattern: a Wi-Fi symbol, a cloud, a logic gate with a square wave input, a square wave signal labeled '1' and '0', and a heartbeat line.

User Manual

Advantech WebAccess/CNC

**CNC Machine Monitoring
Solution**

ADVANTECH

Enabling an Intelligent Planet

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Chapter 1

Advantech
WebAccess/CNC

1.1 Advantech WebAccess/CNC

Advantech WebAccess/CNC is a core solution for network CNC devices. With its 100% web-based WebAccess/SCADA software structure, WebAccess/CNC provides major CNC networking functions in addition to bringing the advantages of SCADA software to the CNC market. By being able to also monitor I/O devices, WebAccess/CNC brings to you the benefits of CNC information management and status visualization. It allows you to browse SCADA web pages via Internet Explorer (IE) so that you can monitor and capture real-time CNC data and production status information. Your operational efficiency can thus be improved by analyzing device availability.

Advantech WebAccess/CNC is a CNC networking software application designed specifically for the machine tool market. Through the integration of several SCADA drivers, WebAccess/CNC supports most CNC, I/O, and PLC devices for data acquisition from factory equipment and gives you the tools you need to develop industrial networking applications.

1.2 Functions and Features

WebAccess/CNC has two main connection methods to purchase:

- Through CNC runtime
- Using a CNC driver

WebAccess/CNC runtime supports four CNC types including FANUC, MITSUBISHI, SIEMENS, and HEIDENHAIN and web functions.

WebAccess/CNC driver supports MTConnect communication, various CNC drivers for FANUC, MITSUBISHI, SIEMENS, HEIDENHAIN, Haas, brother, OKUMA, FAGOR, RODERS, LNC, SYNTEC, HNC, KND, and the robot driver for FANUC and KUKA.

1.2.1 Web Functions (Only for WebAccess/CNC runtime)

- CNC Overview:
Provides real-time information on connection status, operation mode, CNC status, alarm status, and availability.
- CNC Information:
Provides machine coordination information, operation information, G code, and spindle information.
- Availability:
Provides details of CNC availability to assist with handling production efficiency optimization.
- CNC Alarm:
Provides historical alarms from CNC records; these can be used as an important reference for machine maintenance.
- NC Program Management:
Provides a function for uploading/downloading NC files as well as an editing interface for programming NC files.
- Set Parameters:
Provides a configuration interface for modifying coordinate compensation and tool compensation parameters.
- Servo Spin:
Provides real-time monitoring of spindle loading for the analysis of wear or damage to tools.
- PLC Parameters:
Provides an instant query interface to obtain PLC register values which facilitates defining the I/O status requirements of CNC controllers.

1.2.2 Features

- Supports major CNC and I/O monitoring device functions.
- Supports various protocols for connecting common industrial devices and PLCs.
- 100% web-based SCADA software including an HTML5 dashboard with cross-platform compatibility.
- Provides the full functionality of WebAccess professional version.
- Upgradeable to increase the number of available CNC and robot connections.

1.2.3 Specifications

List of Supported CNC Controllers for WebAccess/CNC Runtime

- FANUC: 0i-A/B/C/D/F, 16i, 18i, 21i, 31i, 32i (FOCAS library requirement).
- MITSUBISHI: M700/M70, M800/M80 series.
- HEIDENHAIN: iTNC530, TNC640 (DNC optional requirement)
(The maximum number of connections for HEIDENHAIN is limited to 16 for each instance of WebAccess/CNC runtime).
- SIEMENS: 840Dsl & 828D (OPC UA license requirement).


Note! One WebAccess CNC runtime can connect a maximum of 10 CNCs.
The number of connections depends on the WebAccess/CNC license.



List of Supported CNC and robot Controllers for WebAccess/CNC Driver

- LNC: M/T 2800/2900/5800/6800/6900/7900.
- brother:
 - CNC-B00: TC-22B/31B/32BN/S2D/R2B/20B/S2DN.
 - CNC-C00: S300X1/S500X1/S700X1/S1000X1/S500Z1/S700Z1/M140X1/M140X2/R450X1/R650X1/R450Z1.
 - CNC-D00: W1000Xd1/S300Xd1/S500Xd1/S700Xd1/R450Xd1/R650Xd1/U500Xd1
- FANUC (TCPIP): 0i-A/B/C/D/F, 16i, 18i, 21i, 31i, 32i (FOCAS library is required)
- FANUC (RS232): 15, 16/18/20/21, mate D/F/H, 16i/18i/21i, mate i, 15i, 0i, 30i/31i/32i (using DPRNT command)
- Haas: RS232 & TCPIP connection (NGC).
- SYNTEC: Software 10.116.38M(5th) later & CloudAgent V2.10.1 requirement.
- FANUC ROBOT: LR Mate 200iD, M-10iA, M-20iA, M-710iC, R-2000iC, M-900iB, M-2000iA, M-410iC with controller R-J3iB (7D80/45, 7D81/09, 7D82/01, 7D91/01 or later), R-30iA/30iA Mate/30iB/R-30iB Plus All Versions.
- FAGOR: 806X & 807X series.
- Roders: RMS6-ERP.
- OKUMA: OSP-P200/P200A/P300 for Mill & Latch type (OSP-API requirement).
- SIEMENS: 840 Dsl, 840D, 810D & 828D (via S7/TCP protocol), 840Dsl & 828D (OPC UA license requirement).
- MITSUBISHI: M700/M70, M800/M80 series. (FCSB1224W100 runtime library requirement).
- KUKA ROBOT: KR C4 & C5 controller (KUKA.Device Connector 2.1 OPC UA requirement)
- HNC: HNC 8 series (HNC ServerWindow adapter is required).
- MTConnect: CNC that support MTConnect protocol.
- KND: TCPIP connection (via REST API).

- HEIDENHAIN: iTNC530, TNC640 (via LSV2 protocol).

Note!  The WebAccess/CNC driver can connect more than 50 CNCs simultaneously. The number of connections depends on the WebAccess/CNC license and PC performance. The WebAccess/CNC driver cannot be used with WebAccess/CNC runtime on the same PC. We suggest that you use different PCs to connect different CNC devices.

Multi-Language Support for WebAccess/CNC Runtime

- EN/TC/SC/JP

SCADA Software

- Advantech WebAccess 8.4 Professional or WebAccess 9.x Professional.

Project Node\SCADA Node

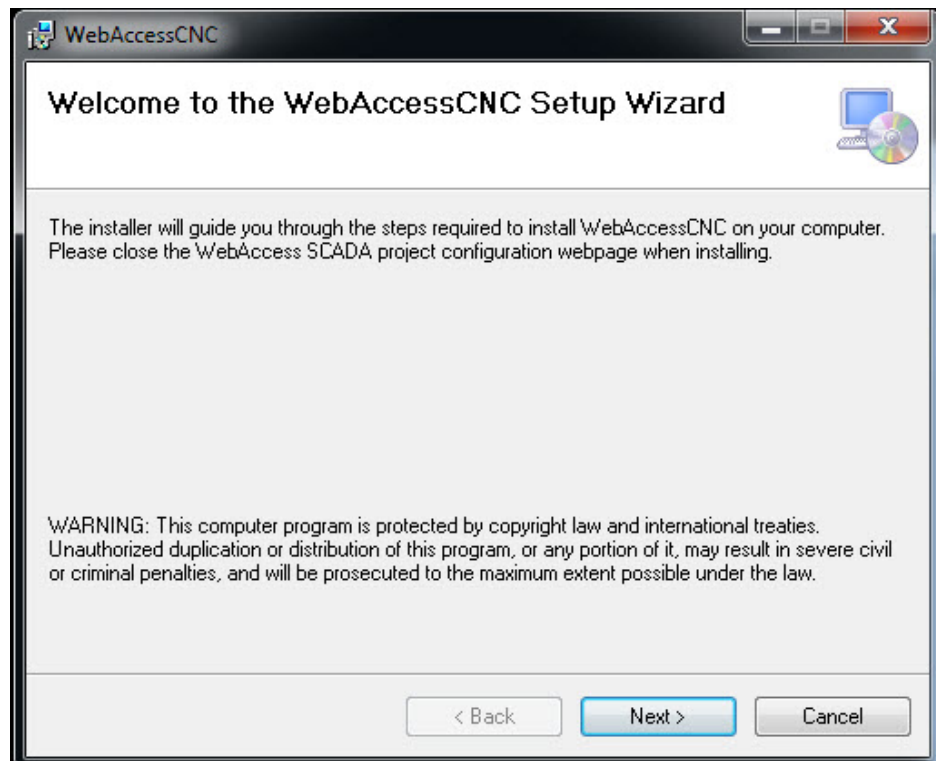
- Operating System:
 - Windows 7 Professional SP1
 - Windows 8.1 Professional
 - Windows Server 2008 R2 or later
 - Windows 10 (no support for Home or Home Premium)
 - Microsoft .NET Framework 3.5 for WebAccess/CNC runtime
 - Microsoft .NET Framework 4.5 or later
 - IIS 7.5
- Minimum Hardware Requirements:
 - Intel® Core™ i3 Dual-Core processor
 - 4GB RAM
 - 200 GB free disk space
- USB Port:
 - USB port for License Hard key on SCADA node
- Browser Resolution:
 - The CNC runtime web page has been optimized for resolutions from 1280x720 to 1920x1080
- Browser support:
 - IE 11 for WebAccess 8.4 and Edge or Chrome for WebAccess 9.x
 - For dashboard support only, use Chrome (Version 37 or later), Firefox (Version 31 or later), or Safari (Version 7 or later)
- Dashboard Viewer
 - Hardware
 - PC: Intel® Core™ i3 with 4 GB RAM
 - iPhone: iPhone 5
 - Android: 1.5 GHz quad-core with 2 GB RAM
 - Windows Phone: 1.5 GHz quad-core with 2 GB RAM
 - Browser Internet Explorer: IE 11
 - Chrome: Version 37
 - Firefox: Version 31
 - Safari: Version 7
- WebAccess APP
 - Platform Environment iOS 9 and Android 4.4

Chapter 2

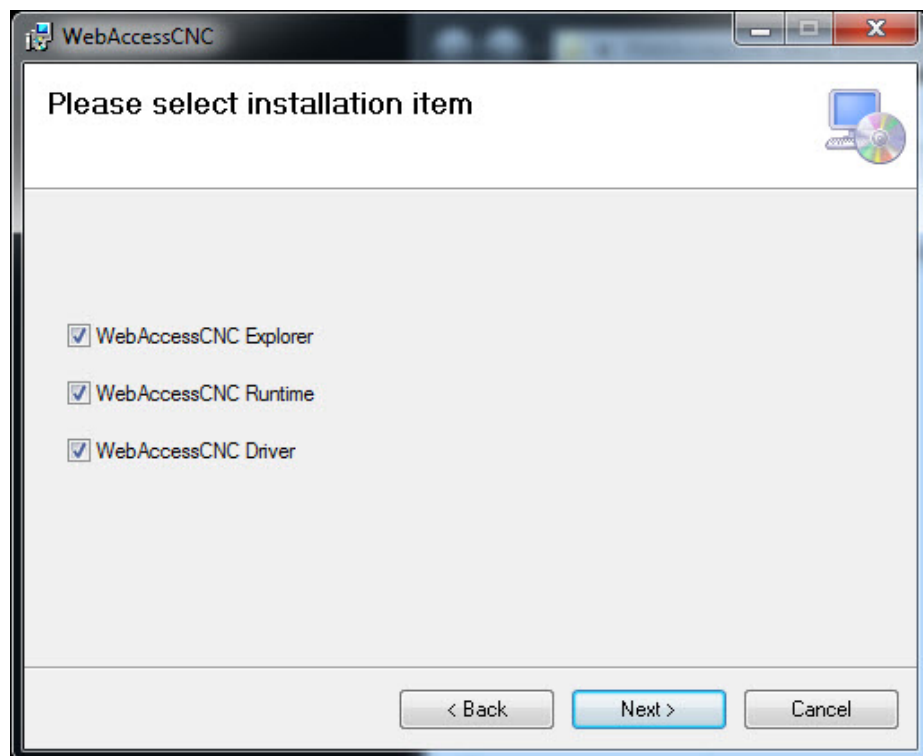
Getting Started

2.1 WebAccess/CNC Installation

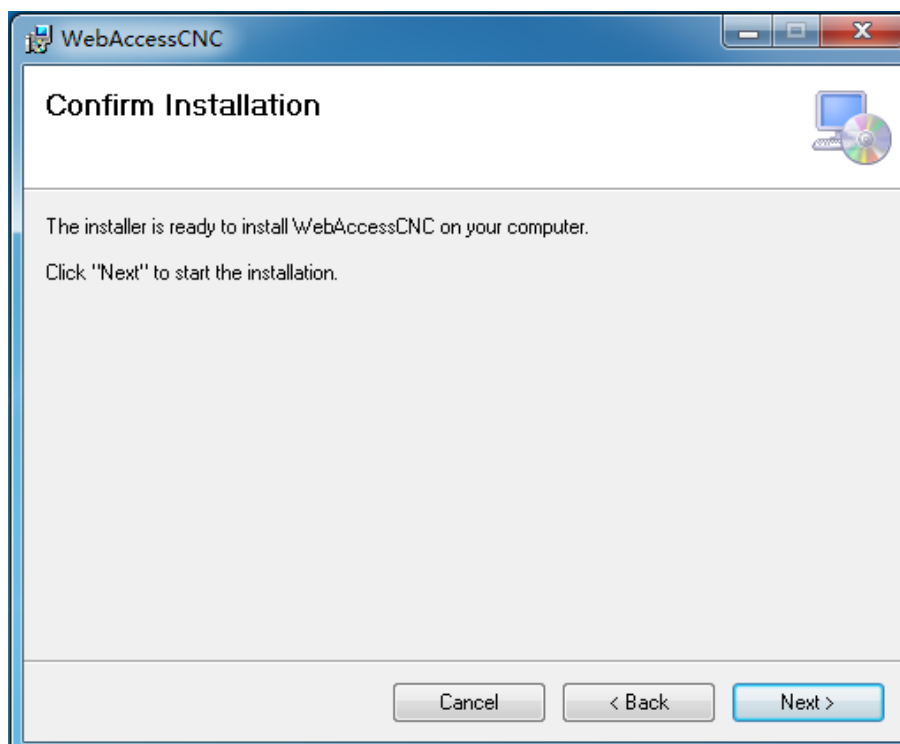
Before you install WebAccess/CNC, you will need to install (1) WebAccess/SCADA 8.4.4 Professional (or later) and (2) IE 11 or later. The following screenshots will guide you step-by-step through the process of installing WebAccess/CNC:



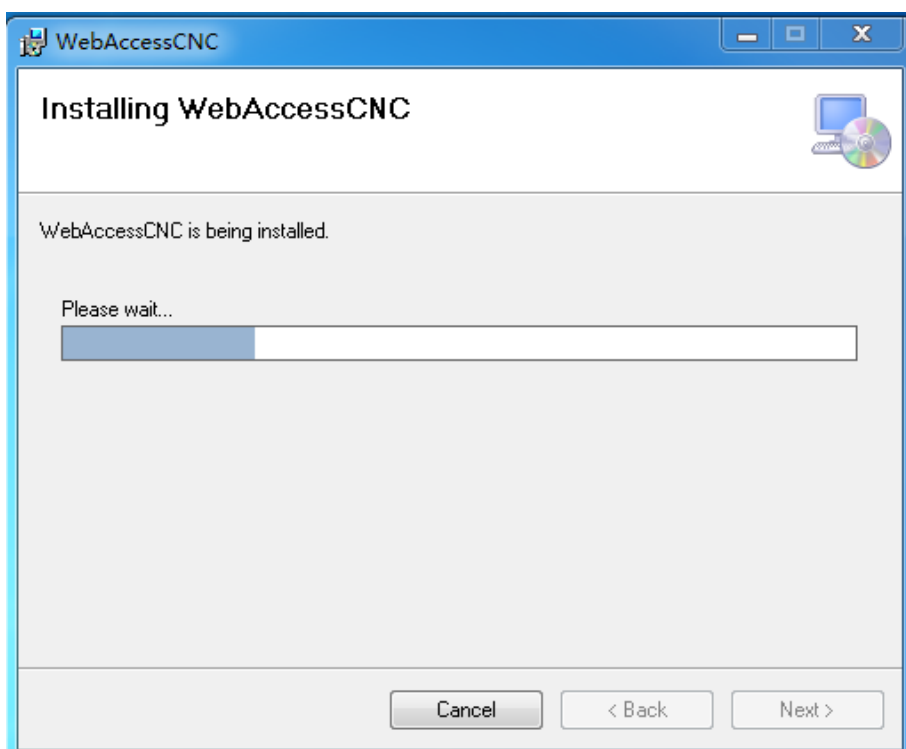
1. Run setup to open the WebAccess/CNC Setup Wizard.



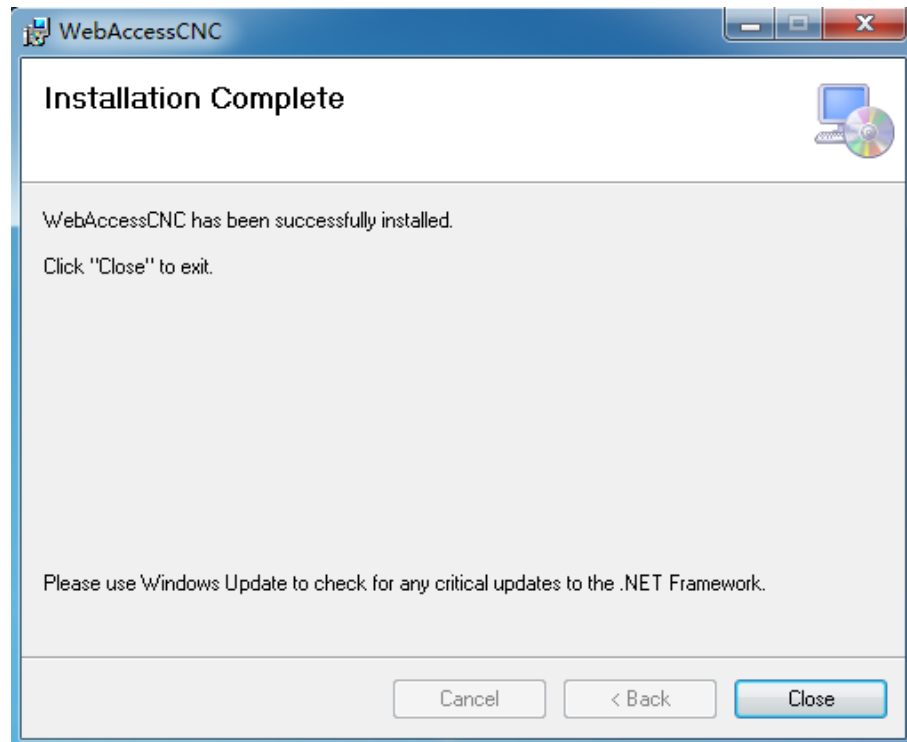
2. Select which items you wish to install.



3. Click **Next** to confirm the installation.



4. Wait for the installation process to complete.



5. Press **Close** to complete the installation.

After the installation has completed, a log file will be available at the following address: C:\WebAccess\Node\WebAccessCNC\install.log

2.2 CNC Device Setting for Using CNC Runtime

The **CNC Device Settings** screen in WebAccess/CNC is for configuring CNC runtime network settings. From this screen, you can add, delete, and modify CNC device settings and also start WebAccess/CNC runtime. The CNC device settings for CNC runtime supports Fanuc, Mitsubishi, Siemens, and Heidenhain CNCs.

Open **CNC Device Settings for CNC Runtime** from the start menu (default: Start → All Programs → WebAccess CNC → CNC Device Setting for CNC Runtime). The launch screen will appear as shown in Figure 2.1.

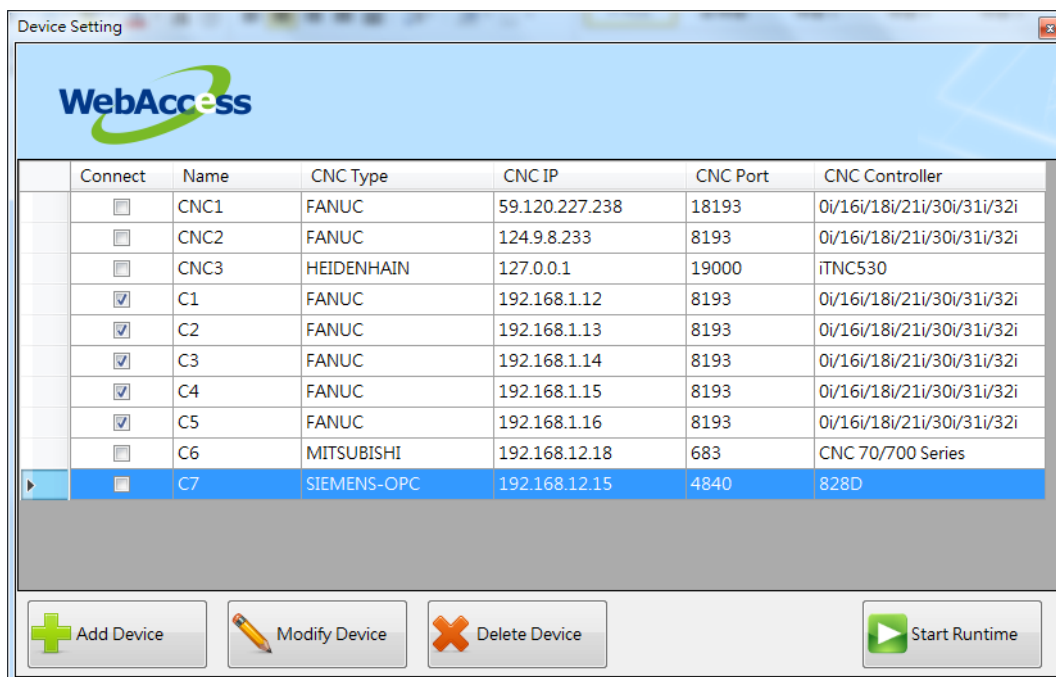


Figure 2.1 Device Settings for CNC Runtime

Click **Add** to open the **Add Device** screen (Figure 2.2) or **Modify** to open the **Modify Device** screen (Figure 2.3). Click **Delete Device** to delete a device. From the **Add Device** screen, you can set the CNC name, CNC type, controller type, CNC IP, CNC port, and data server settings.

DeviceSetting --> Add

Name: C8

CNC Type: FANUC

Controller: 0i/16i/18i/21i/30i/31i/32i

CNC IP: 192.168.12.20

CNC Port: 8193

Data Server

☐ No Data Server ☒ Data Server

Account: User

Password: test

Save Cancel

Figure 2.2 Add Device

DeviceSetting --> Modify

Name: CNC3

CNC Type: HEIDENHAIN

Controller: iTNC530

CNC IP: 127.0.0.1

CNC Port: 19000

Data Server

☒ No Data Server ☐ Data Server

Save Cancel

Figure 2.3 Modify Device

There are two methods for starting CNC Runtime:

1. Click **Start Runtime** on the **CNC Device Settings** screen. This will enable the CNC runtime connection between the selected CNC devices.
2. From the start menu: Start → All Programs → WebAccess CNC → Start WebAccess CNC Runtime.

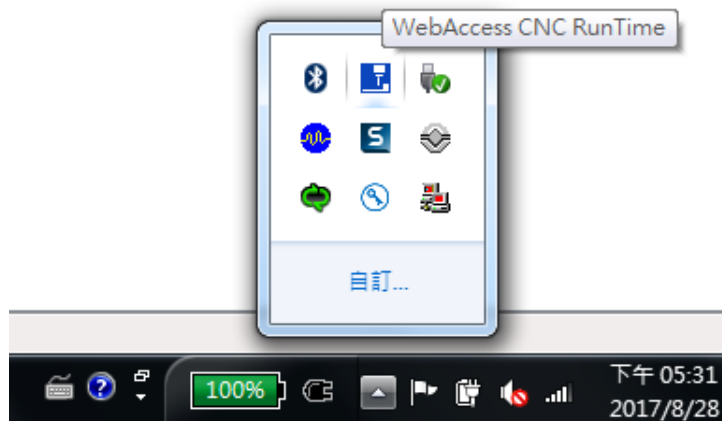


Figure 2.4 WebAccess CNC Runtime

Note! You can right-click on the WebAccess CNC Runtime icon in the notification area to exit the runtime service.



The CNC runtime settings will be recorded in the corresponding path of the installation sector as "C:\XML\SkyMarsNoUISet.xml".

2.3 WebAccess/CNC Explorer

WebAccess/CNC Explorer gives you access to five main screens: Project Selection, Runtime Device Selection, Driver Connection Setting, Start Searching, and Device List. It provides a configuration interface displaying the supported CNC connection parameters. You can also use this tool to automatically generate WebAccess/CNC projects.

You can start WebAccess/CNC Explorer from the start menu (default: Start → All Programs → WebAccessCNC → Start WebAccess CNC Explorer).

- **Project Selection:** This screen (Figure 2.5) allows you to set the WebAccess project name and node name. You can create a new project or select an existing one.

1 2 3 4 5
PROJECT SELECTION RUNTIME DEVICE SELECTION DRIVER CONNECTION SETTING START SEARCHING DEVICE LIST

Project Selection

Project Name
CNC

Node Name
SCADA

Next >

Figure 2.5 Project Selection

- **Runtime Device Selection:** This screen (Figure 2.6) allows you to enter the IP address and port number of WebAccess/CNC Runtime. The default port number is 9701. Note that "pmc" is the default key for both the Conn Key and the Write Key.

Figure 2.6 Runtime Device Selection

- **Driver Connection Setting:** This screen (Figure 2.7) allows you to add the supported CNC and robot controllers. LNC controllers are supported by automatic searching in the same network segment. You can also set the IP address of the LNC controller manually. You will need to configure the IP address and port settings of supported CNC and robot devices.

Figure 2.7 Driver Connection Setting

- **Start Searching:** This screen allows you to search for the new connection settings from the CNC runtime and CNC driver.
- **Device List:** After connected CNC devices have been detected, you can submit the selected CNC devices to automatically generate a WebAccess project. If you click the device you want, it will be generated in this project; unclicking a device will delete it from the current project (see Figure 2.8).

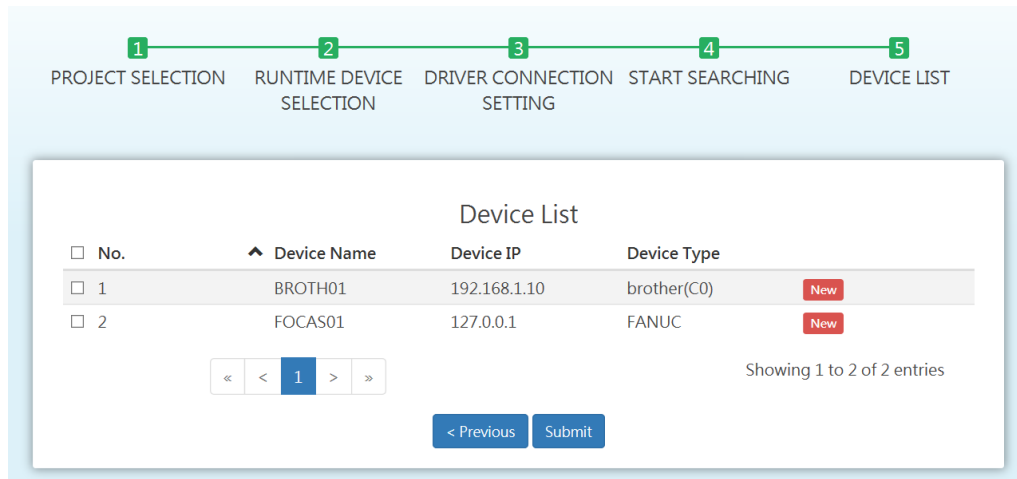


Figure 2.8 Device List

Note! *If you add a search list at the runtime device selection step, the driver connection setting step will not be an option. WebAccess/CNC runtime cannot be used in conjunction with the WebAccess/CNC driver.*



2.4 Start Mode and Watchdog Functions of WebAccess CNC Runtime

When you start WebAccess CNC runtime after powering on, the opening sequence of WebAccess/SCADA must start earlier than WebAccess CNC runtime. Therefore the user can use the “User Program” function to start the CNC runtime when the WebAccess/SCADA is started. The execution path of CNC runtime is “C:\WebAccessCNC Runtime\SkyMars.exe”. It can be used to start CNC runtime automatically in the “User Program” setting. The watchdog tool of CNC runtime can be found under the path “C:\WebAccessCNC Runtime\” and the watchdog tool name is WDDSky-mars.bat. You can use the watchdog tool to start the CNC runtime to keep it active as in Figure 2.9.

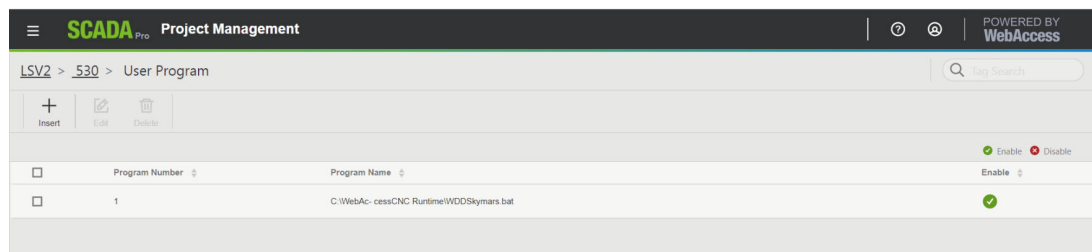


Figure 2.9 Set up the watchdog tool of CNC runtime in User Program

Chapter 3

WebAccess/CNC
Runtime
Web Functions

3.1 CNC Web Functions

Projects created using WebAccess/CNC runtime provide seven main CNC tool functions:

- Overview
- Information
- CNC alarm
- Program
- Servo spin
- Set parameters
- PLC parameters

Note! *The seven CNC functions of the web pages are designed for the common functions of Fanuc, Mitsubishi, Heidenhain and Siemens CNC. The functions are not all suitable for the each CNC types.*



3.1.1 The Overview Screen

As shown in Figure 3.1, there are four CNC conditions indicated by the lamp status:

- Green: Busy
- Yellow: Idle
- Red: Alarm
- Grey: Disconnect

The other fields are defined as:

- Device Name: The CNC device name
- Main Prog: Main program
- Cur Prog: Currently executed program
- Cur Seq: Sequence of the currently executed program
- Mode: MEM/MDI/JOG/MPG(RPF)/single step/other
- Status: Start/hold
- Alarm: Normal/alarm
- EMG: Normal/EMG
- P count: Part count
- Avail. (Today): Availability rate for the current day

The screenshot shows the 'Overview' screen of the WebAccess interface. At the top, there's a status bar with four colored circles and their counts: Green (4), Yellow (2), Red (0), and Grey (0). Below this is a table with 11 columns: Device Name, Main Prog, Cur Prog, Cur Seq, Mode, Status, Alarm, EMG, P Cnt, and Avail (Today). The table lists six CNC devices with their respective status and data.

Device Name	Main Prog	Cur Prog	Cur Seq	Mode	Status	Alarm	EMG	P Cnt	Avail (Today)
CNC1	O22	O22	0	MEM	OTHERS	NORMAL	NORMAL	0	0
CNC6	O777	O4	0	RMT	START	NORMAL	NORMAL	14821	0.6
CNC4	O777	O628	0	RMT	START	NORMAL	NORMAL	21395	0.76
CNC2	O8000	O8000	9	MEM	START	NORMAL	NORMAL	8495	0.99
CNC5	O777	O1	0	RMT	START	NORMAL	NORMAL	8236	0.92
CNC3	O777	O777	0	RMT	OTHERS	NORMAL	NORMAL	15945	0.8

Figure 3.1 Overview Screen

3.1.2 The Information Screen

Data monitoring allows you to monitor data from connected CNC devices in real time, including CNC status, coordinates, G-code, non-G-code, part count, CNC operating time, actual feed rate, and actual speed.

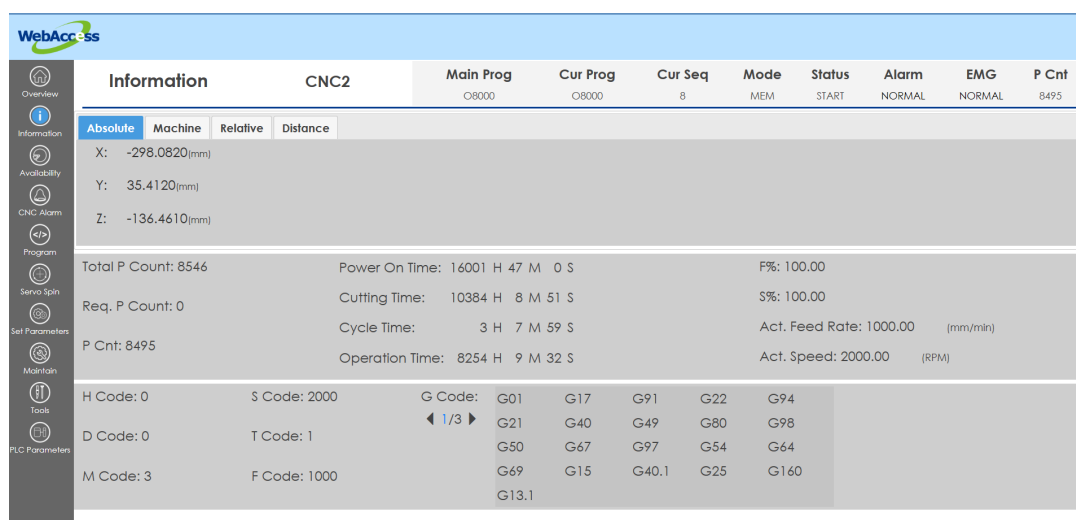


Figure 3.2 Information Screen

3.1.3 The Availability Screen

The query tool provides details of CNC availability inquiries to assist you with handling production efficiency optimization.

This availability is for reference only, and the calculation formula is as follows:

$$\text{Availability} = (\text{Busy time}) / (\text{Busy time} + \text{Alarm time} + \text{Idle time})$$

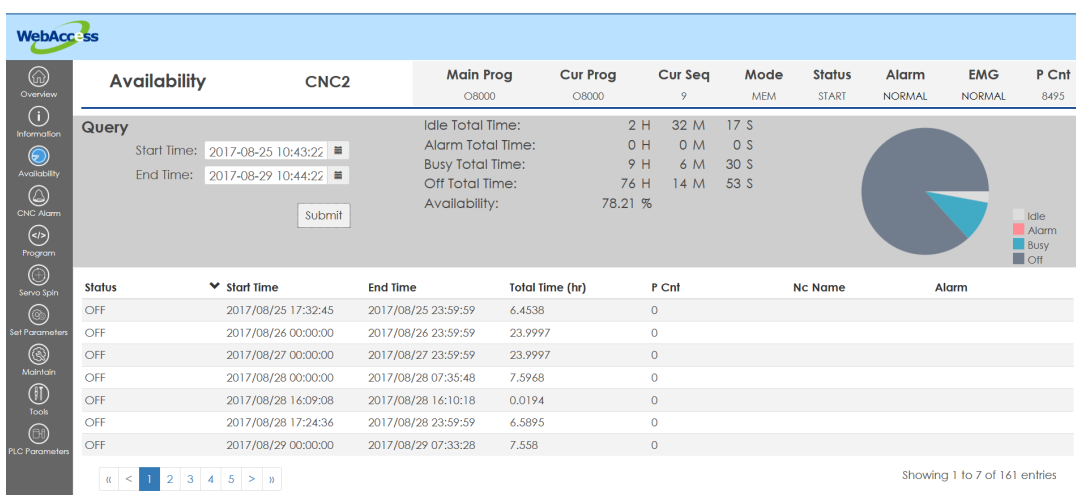
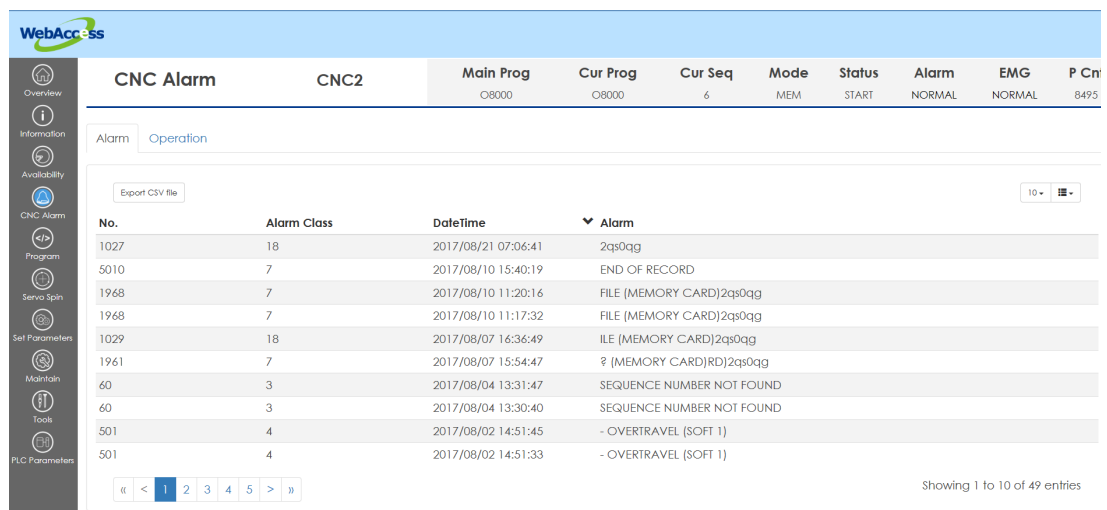


Figure 3.3 Availability Screen

3.1.4 The CNC Alarm Screen

This screen provides information on historical alarms and CNC operation records.



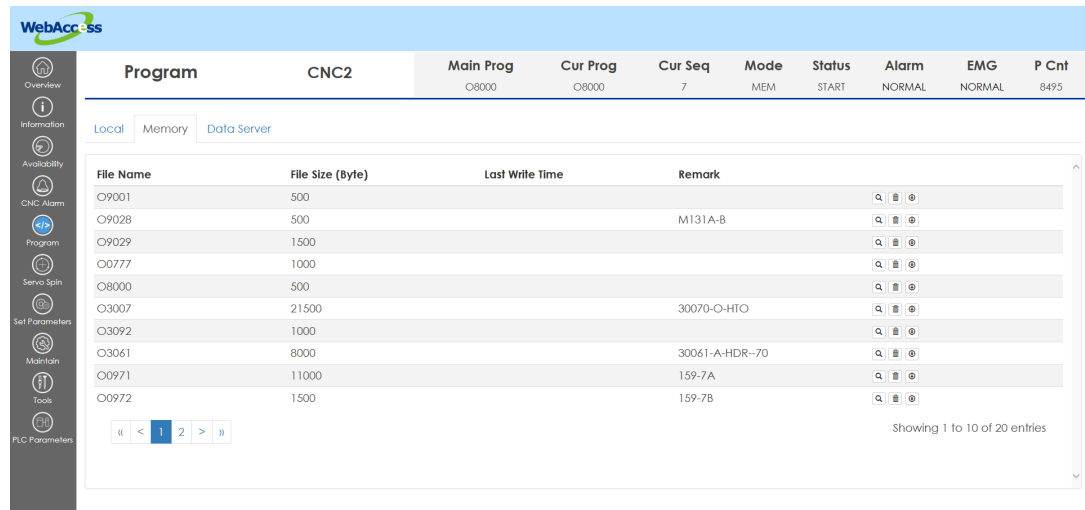
No.	Alarm Class	DateTime	Alarm
1027	18	2017/08/21 07:06:41	2qs0qg
5010	7	2017/08/10 15:40:19	END OF RECORD
1968	7	2017/08/10 11:20:16	FILE (MEMORY CARD)2qs0qg
1968	7	2017/08/10 11:17:32	FILE (MEMORY CARD)2qs0qg
1029	18	2017/08/07 16:36:49	ILE (MEMORY CARD)2qs0qg
1961	7	2017/08/07 15:54:47	? (MEMORY CARD)RD)2qs0qg
60	3	2017/08/04 13:31:47	SEQUENCE NUMBER NOT FOUND
60	3	2017/08/04 13:30:40	SEQUENCE NUMBER NOT FOUND
501	4	2017/08/02 14:51:45	- OVERTRAVEL (SOFT 1)
501	4	2017/08/02 14:51:33	- OVERTRAVEL (SOFT 1)

Figure 3.4 Alarm Screen

You can export alarm and operation in .CSV format. Note that the file will be created in the current project folder (e.g., C:\WebAccess\Node\Project Name_Node Name\log\Device Name).

3.1.5 The Program Screen

This screen provides a function for uploading/downloading NC files and an editing interface for programming NC files.



File Name	File Size (Byte)	Last Write Time	Remark
O9001	500		
O9028	500		M131A-B
O9029	1500		
O0777	1000		
O8000	500		
O3007	21500		30070-O-HTO
O3092	1000		
O3061	8000		30061-A-HDR-70
O0971	11000		159-7A
O0972	1500		159-7B

Figure 3.5 Program Screen

You can download NC files from memory or a data server to a local folder under your project (e.g., C:\WebAccess\Node\Project Name_Node Name\pgm\Device Name). The path of the memory folder can be set by the driver tag “MNcPath.” The default value of this tag is an empty string. Some examples of “MNcPath” are listed as follows:

FANUC: //CNC_MEM/USER/PATH1/

SIEMENS: /nckfs/_N_MPF_DIR

HEIDENHAIN iTNC530: TNC:\demo\

HEIDENHAIN TNC640: TNC:\nc_prog\demo\

3.1.6 The Servo Spin Screen

This screen provides real-time monitoring information on spindle loading, which allows you to analyze tool wear/damage.

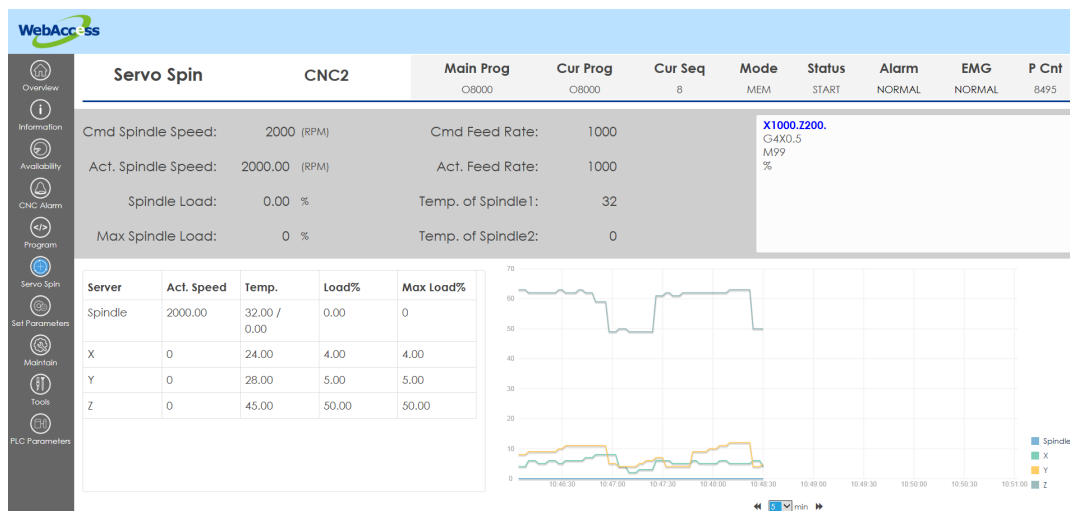


Figure 3.6 Servo Spin Screen

3.1.7 The Set Parameters Screen

This screen provides tool offset, work coordinates, and macro variable read/write functions.

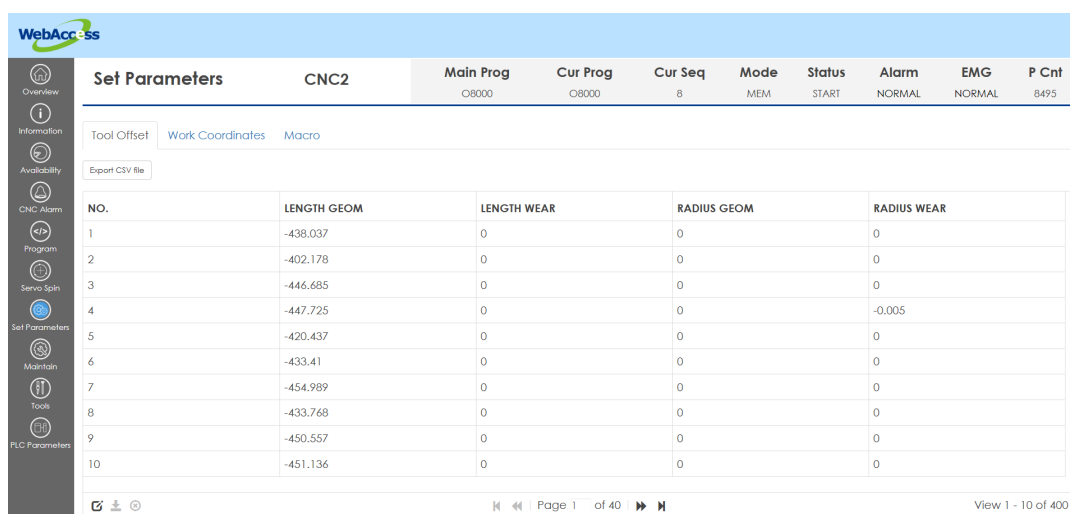


Figure 3.7 Set Parameters screen

3.1.8 The PLC Parameters Screen

WebAccess/CNC provides a PLC register query interface for obtaining information on I/O or memory status. This function can help you to create tags for monitoring the I/O status of CNC machines.

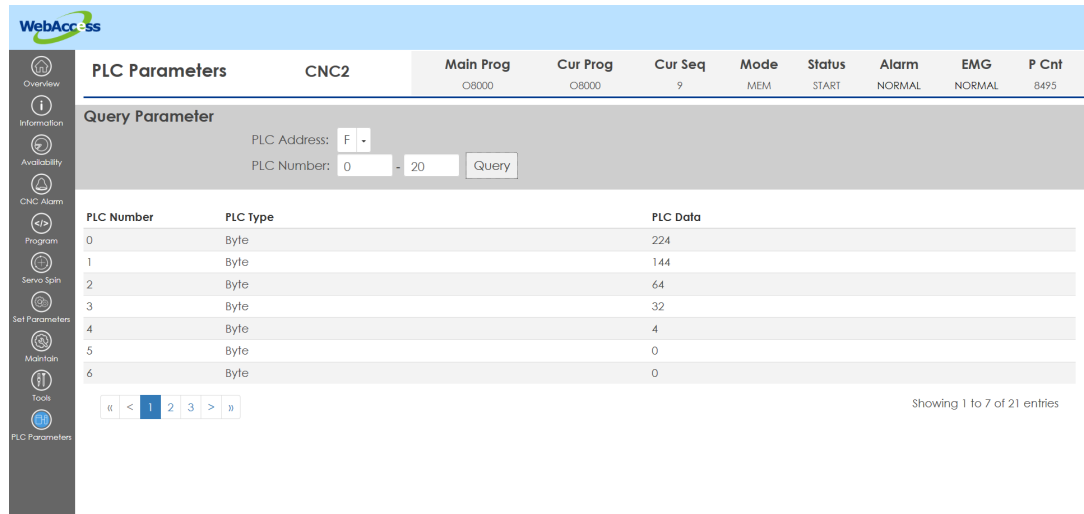


Figure 3.8 PLC Parameters Screen

3.2 Parameters of WebAccess/CNC Webpages

The resolution for WebAccess/CNC functions to be viewable is from 1280 x 720 to 1920 x 1080. The blue WebAccess title bar of the WebAccess/CNC functions web page can be removed by setting the video display parameter “mode” of wacnc.drw, as follows:

uti:../WebAccessCNC/index.asp?goto=graph=main&mode=1&hwnd=%HWND&

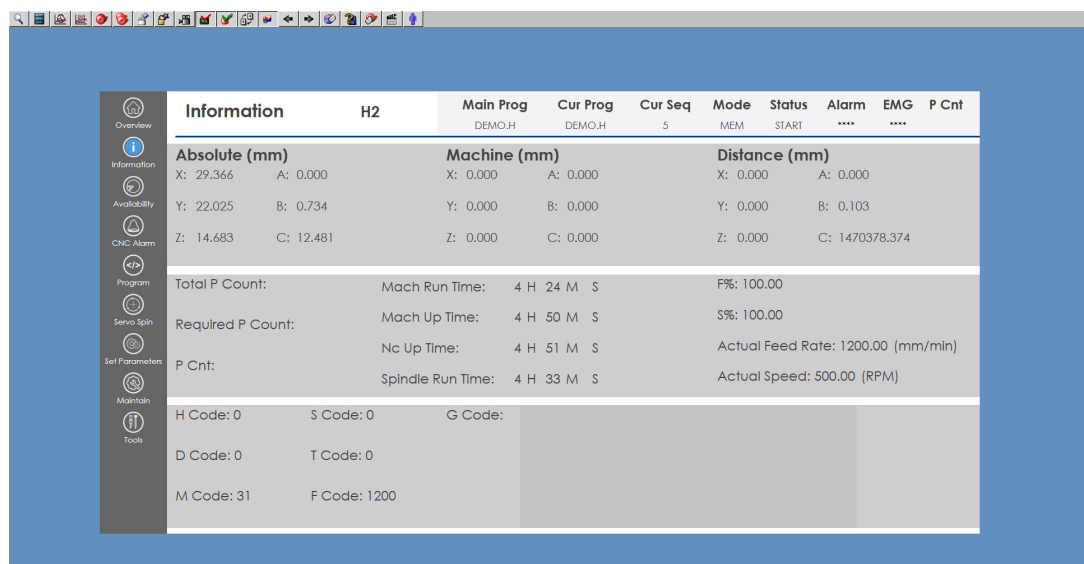


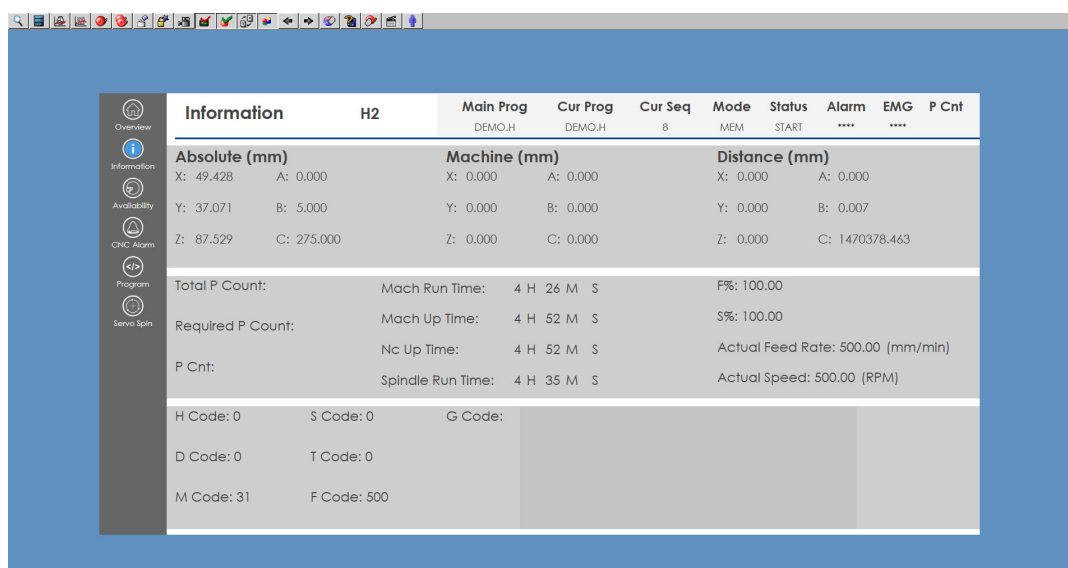
Figure 3.9 Removing the WebAccess Title Bar

You can set which of the nine main CNC tool screens can be viewed in addition to the Overview screen. Which screens are viewable can be modified by setting the video display parameter “menu” of the wacnc.drw as follows:

uti:../WebAccessCNC/index.asp?goto=graph=main&menu=32&hwnd=%HWND&

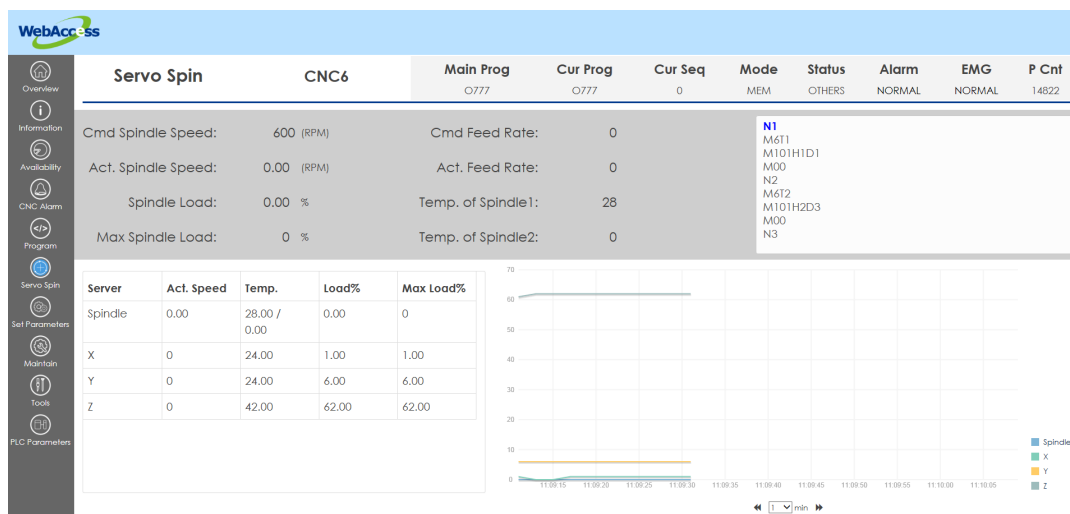
Table 3.1: WebAccess/CNC menu parameter definition

"menu" value	0	2	6	32	64
Information	✓	✓	✓	✓	✓
Availability	✓	✗	✗	✓	✓
CNC Alarm	✓	✓	✗	✓	✓
Program	✓	✓	✓	✓	✓
Servo Spin	✓	✓	✓	✓	✓
Set Parameters	✓	✓	✓	✗	✓
PLC Parameters	✓	✓	✓	✓	✗

**Figure 3.10 Available Functions When the Setting “menu=32” is Applied**

You can set each CNC device's information page so that it can be accessed directly. To do this, adjust the video display parameters “device” and “comport” in your DRW file as follows:

uti.../WebAccessCNC/index.asp?**device=CNC6&comport=1**&hwnd=%HWND&

**Figure 3.11 Directly Access the WebAccess/CNC Device Information Page**

Each screen for the different CNC device functions can be accessed directly by setting the video display parameters “page” in your DRW file as follows:
uti:../WebAccessCNC/index.asp?device=H1&comport=1&**page=program**&hwnd=%HWND&

Table 3.2: WebAccess/CNC page parameter definition

Functions	Page Name
Overview	page=overview
Information	page=info
Availability	page=avail
CNC Alarm	page=alarm
Program	page=program
Servo Spin	page=servo
Set Parameters	page=parameter
PLC Parameters	page=plcparameter

Chapter 4

WebAccess/CNC
Runtime & Driver List

4.1 CNC Runtime API List

Table 4.1 lists the third party API (SkyMars) definitions for CNC runtime.

Table 4.1: Supports APIs (See the SKYMARS API Manual)	
API	Description
SKY_conn_status_single	Get the CNC connection status
GET_information	Get basic correlation information
GET_information_heid	Get basic correlation information (HEIDENHAIN controller)
GET_status	Get status information
GET_position	Get the coordinate status
GET_gcode	Get the G-code
GET_othercode	Get other codes (H, D, T, M, B, F, and S)
GET_feed_spindle	Get the feed rate/spindle speed
GET_time	Get the CNC system time
GET_time_heid	Get the CNC system time (HEIDENHAIN controller)
GET_part_count	Get the part count
GET_part_total	Get the total part count
GET_part_required	Get the required part count
GET_alm_current2	Get current occurring alarm
GET_msg_current	Get the operation message
GET_alm_history2	Get the alarm history
GET_msg_history	Get the operation history
GET_plc_alarm	Get the PLC alarm history
GET_servo_current	Get current loads of all spindles
GET_servo_load	Get the servo load percentage (%)
GET_servo_speed	Get the servo speed
GET_spindle_load	Get the percentage of spindle load (%)
GET_spindle_speed	Get the spindle speed
GET_servo_temperature	Get the servo motor temperature
GET_spindle_temperature	Get the spindle temperature
GET_utilization_all_today	Get the utilization rate data for the current day
GET_utilization_single_all	Get all utilization rate data for a single machine
GET_nc_mem_list	Get the NC list from the machine (memory)
GET_nc_ftp_list	Get the NC list from FTP (Fanuc Data Server/MITSUBISHI CF card)
GET_nc_local_list (*)	Get the NC list from local storage
GET_nc_mem_code	Get the NC program content from memory
GET_nc_ftp_code	Get the NC program content from FTP (Fanuc Data Server/MITSUBISHI CF card)
GET_nc_pointer	Get the pointer (line) of the current NC
GET_nc_current_block	Get the NC of the current and next block
UPLOAD_nc_mem	Upload NC data to memory
UPLOAD_nc_ftp	Upload NC data to FTP (Fanuc Data Server/MITSUBISHI CF card)
DEL_nc_mem	Clear NC data from memory
DEL_nc_ftp	Delete NC data from FTP (Fanuc Data Server/MITSUBISHI CF card)
DEL_nc_local (*)	Delete NC data from local storage

SET_nc_main	Set or assign NC data to the main program
GET_plc_ver	Get the PLC version information
GET_plc_addr2	Get the PLC address of start and end number
GET_plc_status2	Get the PLC status
GET_offset_title	Get the title of the tool offset
GET_offset_all	Get the offset of all tools
SET_offset_single	Write the offset of a single tool
GET_macro_all	Get data for all macro (common) variables
SET_macro_single	Set data for a single macro (common) variable
GET_TOOL_TABLE_SIE- MENS	Get SIEMENS tool tables
GET_TOOL_EDGE_PA- RAMETER_SIEMENS	Get SIEMENS tool edge parameters

(*): not SkyMars API

4.2 CNC Runtime and CNC Driver List

Table 4.2: WebAccess/CNC Driver List			
WebAccess/ CNC	Connected Device Types	Driver Name	Default Block Type Name
CNC Runtime	FANUC CNC (FOCAS TCP/IP)	SkyMars	FANUC
CNC Runtime	MITSUBISHI CNC	SkyMars	MIT
CNC Runtime	HEIDENHAIN CNC (DNC option)	SkyMars	HEID
CNC Runtime	SIEMENS CNC (OPC UA)	SkyMars	SIEMENS
CNC Driver	LNC CNC (Recon Library)	LNCRecon	LNC
CNC Driver	brother B00 CNC	CncBroB0	brotherB
CNC Driver	brother C00 CNC	CncBroC0	brotherC
CNC Driver	brother D00 CNC	CncBroD0	brotherD
CNC Driver	FANUC CNC (FOCAS TCP/IP)	FOCAS	FOCAS
CNC Driver	FANUC CNC (RS232)	DPRNT	
CNC Driver	Haas CNC (RS232 and TCP/IP)	Haas	HAAS
CNC Driver	FANUC Robot (OPC UA)	FRobot	FRobot
CNC Driver	FAGOR 806X/807X CNC	FAGOR	Fagor
CNC Driver	Roders RMS6-ERP	RMS6_ERP	RMS6-ERP
CNC Driver	OKUMA Mill CNC (OSP API)	OKUMAL	OKUMAL
CNC Driver	OKUMA Lathe CNC (OSP API)	OKUMAM	OKUMAM
CNC Driver	SIEMENS 840D/810D CNC (S7/ TCP)	S840D	S840D
CNC Driver	SIEMENS 828D CNC (S7/TCP)	S828D	S828D
CNC Driver	MITSUBISHI CNC	MitsuCNC	MitsuCNC
CNC Driver	KUKA Robot (OPC UA)	KukaUA	KukaUA
CNC Driver	HNC CNC (Server window adapter)	hncsdk	hncsdk
CNC Driver	SIEMENS CNC (OPC UA)	SinuUA	SinuUA
CNC Driver	KND CNC (REST API)	KND	KND
CNC Driver	HEIDENHAIN iTNC 530 CNC (LSV2)	LSV2	LSV2
CNC Driver	HEIDENHAIN TNC 640 CNC (LSV2)	LSV2_640	LSV2_640


Note!  You can refer to the default driver block to create a new block for your own project needs. The advantage is that it can quickly establish the required tags and reduce unnecessary load on communication. The block name you create cannot be the same as the default name.

Table 4.3: CNC Runtime Tag List (FANUC, MITSUBISHI, HEIDENHAIN, and SIEMENS)

Tag Name	Address	Type	Description
MachName	Common;20001	Text	Machine name
MNcPath	Common;20017	Text	NC file path in memory
FNcPath	Common;20018	Text	NC file path in data server (FTP)
Supports CNC: FANUC, MITSUBISHI, HEIDENHAIN, SIEMENS			
DEL_nc_ftp			
Supports CNC: FANUC, MITSUBISHI, SIEMENS			
DelFPgm	DEL_nc_ftp;10009	Discrete	Flag (0 ->1) from deleting a NC program as DelFName from the data server
DelFName	DEL_nc_ftp;20009	Text	Deleted (FTP server) NC program name (input)
DEL_nc_mem			
Supports CNC: FANUC, MITSUBISHI, HEIDENHAIN, SIEMENS			
DelMPgm	DEL_nc_mem;10008	Discrete	Flag (0 ->1) from deleting a NC program as DelMName from CNC memory
DelMName	DEL_nc_mem;20008	Text	Deleted (memory) NC program name (input)
DEL_nc_local			
Supports CNC: FANUC, MITSUBISHI, HEIDENHAIN, SIEMENS			
DelLPgm	DEL_nc_mem;10010	Discrete	Flag (0 ->1) from deleting a NC program as DelLName from the local disk
DelLName	DEL_nc_mem;20010	Text	Deleted (local disk) NC program name (input)
GET_alm_current2			
Supports CNC: FANUC, MITSUBISHI, HEIDENHAIN, SIEMENS			
AlmClass	GET_alm_current2;0,Alm-Data,1,AlmClass	Text (Array)	Alarm class
AlmCode	GET_alm_current2;0,Alm-Data,1,AlmCode	Text (Array)	Alarm code
AlmMsg	GET_alm_current2;0,Alm-Data,1,AlmMsg	Text (Array)	Alarm message
IsAlarm	GET_alm_current2;1,IsAlarm	Discrete	Alarm status
GET_alm_history2			
Supports CNC: FANUC, MITSUBISHI, HEIDENHAIN, SIEMENS			
AlmClasH	GET_alm_history2;0,Alm-His,1,AlmClass	Text (Array)	History alarm class
AlmCodeH	GET_alm_history2;0,Alm-His,1,AlmCode	Text (Array)	History alarm code

Table 4.3: CNC Runtime Tag List (FANUC, MITSUBISHI, HEIDENHAIN, and SIEMENS)			
AlmDateH	GET_alm_history2;0,Alm-His,1,AlmDate	Text (Array)	History alarm date
AlmMsgH	GET_alm_history2;0,Alm-His,1,AlmMsg	Text (Array)	History alarm message
GetHAlm	GET_alm_history2;10001	Discrete	Flag (0 ->1) from getting the history alarm including AlmClasH, AlmCodeH, AlmDateH & AlmMsgH
GET_feed_spindle			
Supports CNC: FANUC, MITSUBISHI, HEIDENHAIN, SIEMENS			
ActFeed	GET_feed_spindle;1,ActFeed	Analog	Actual feed rate
ActSpin	GET_feed_spindle;1,ActSpindle	Analog	Actual spindle speed
OvFeed	GET_feed_spindle;1,OvFeed	Analog	Feed override
OvSpin	GET_feed_spindle;1,OvSpindle	Analog	Spindle override
GET_gcode			
Supports CNC: FANUC, MITSUBISHI, SIEMENS			
GCode	GET_gcode;0,gcode,1,Gdata	Text (Array)	G-code
GET_information			
Supports CNC: FANUC, MITSUBISHI, SIEMENS			
Axes	GET_information;1,Axes	Analog	Current number of axes
CncType	GET_information;1,CncType	Text	e.g., '18' = Series 180/180i
MaxAxes	GET_information;1,MaxAxes	Analog	Maximum number of axes for this CNC type
NcVer	GET_information;1,Nc_Ver	Text	NC version
Series	GET_information;1,Series	Text	M/T type
GET_information_heid			
Supports CNC: HEIDENHAIN			
Axes_H	GET_information_heid;1,Axes	Analog	Axes (HEIDENHAIN)
FCL_H	GET_information_heid;1,FCL	Text	FCL (HEIDENHAIN)
Model_H	GET_information_heid;1,Model	Text	Model (HEIDENHAIN)
NcVer_H	GET_information_heid;1,Nc_Ver	Text	NC version (HEIDENHAIN)
PlcVer_H	GET_information_heid;1,Plc_Ver	Text	PLC version (HEIDENHAIN)
GET_msg_current			
Supports CNC: FANUC			
IsMsg	GET_msg_current;1,IsMsg	Discrete	Message status
MsgCode	GET_msg_current;1,MsgCode	Text	Operation message code
MsgText	GET_msg_current;1,MsgText	Text	Operation message text
GET_msg_history			
Supports CNC: FANUC			
MsgCodeH	GET_msg_history;0,MsgHis,1,MsgCode	Text (Array)	History operation message code
MsgDateH	GET_msg_history;0,MsgHis,1,MsgDate	Text (Array)	History operation message date

Table 4.3: CNC Runtime Tag List (FANUC, MITSUBISHI, HEIDENHAIN, and SIEMENS)

MsgTextH	GET_msg_history;0,MsgHis,1,MsgText	Text (Array)	History operation message text
GetHMsg	GET_msg_history;10002	Discrete	Flag (0 ->1) from getting the history operation message including MsgCodeH, MsgDateH & MsgTextH
GET_nc_current_block			
Supports CNC: FANUC, MITSUBISHI, HEIDENHAIN, SIEMENS			
CurNcBlk	GET_nc_current_block;0,NcBlock,1,Block	Text (Array)	Get the content of the currently running program blocks
GET_nc_ftp_code			
Supports CNC: FANUC, MITSUBISHI, SIEMENS			
GetFPgm	GET_nc_ftp_code;10005	Discrete	Flag (0 ->1) from getting a NC program as FQNc from a data server
FQNc	GET_nc_ftp_code;20005	Text	FTP data server: NC program name (input)
GET_nc_ftp_list			
Supports CNC: FANUC, MITSUBISHI, SIEMENS			
FNcTime	GET_nc_ftp_list;0,NcList,1,DateTime	Text (Array)	FTP data server: NC program modification date
FNcFD	GET_nc_ftp_list;0,NcList,1,FD	Text (Array)	FTP data server: NC program file type (file/directory)
FNcName	GET_nc_ftp_list;0,NcList,1,NcName	Text (Array)	FTP data server: NC program name
FNcSize	GET_nc_ftp_list;0,NcList,1,Size	Analog (Array)	FTP data server: NC size (Bytes)
GetFList	GET_nc_ftp_list;10019	Discrete	Flag (0 ->1) from getting the NC program list from a data server (FTP) including FNcTime, FNcFD, FNcName & FNcSize
GET_nc_local_list			
Supports CNC: FANUC, MITSUBISHI, HEIDENHAIN, SIEMENS			
LNcTime	GET_nc_local_list;0,NcList,1,DateTime	Text (Array)	Local PC: NC program modification date
LNcName	GET_nc_local_list;0,NcList,1,NcName	Text (Array)	Local PC: NC program name
LNcSize	GET_nc_local_list;0,NcList,1,Size	Analog (Array)	Local PC: NC size (Bytes)
GetLList	GET_nc_local_list;10017	Discrete	Flag (0 ->1) from getting the NC program list from a local disk including LNcTime, LNcName & LNcSize
GET_nc_mem_code			
Supports CNC: FANUC, MITSUBISHI, HEIDENHAIN, SIEMENS			
GetMPgm	GET_nc_mem_code;10004	Discrete	Flag (0 ->1) from getting a NC program as MQNc from CNC memory
MQNc	GET_nc_mem_code;20004	Text	Internal memory: NC program name (input)
GET_nc_mem_list			
Supports CNC: FANUC, MITSUBISHI, HEIDENHAIN, SIEMENS			
MNcTime	GET_nc_mem_list;0,NcList,1,DateTime	Text (Array)	Machine memory: NC program modification date

Table 4.3: CNC Runtime Tag List (FANUC, MITSUBISHI, HEIDENHAIN, and SIEMENS)			
MNcFD	GET_nc_mem_list;0,NcList,1,FD	Text (Array)	Machine memory: NC program file type (file/directory)
MNcName	GET_nc_mem_list;0,NcList,1,NcName	Text (Array)	Machine memory: NC program name
MNcRmk	GET_nc_mem_list;0,NcList,1,Remark	Text (Array)	Machine memory: NC program remark
MNcSize	GET_nc_mem_list;0,NcList,1,Size	Analog (Array)	Machine memory: NC program size (Bytes)
GetMList	GET_nc_mem_list;10018	Discrete	Flag (0 ->1) from getting the NC program list from CNC memory including MNcTime, MNcFD, MNcName, MNcRmk & MNcSize
GET_nc_pointer			
Supports CNC: FANUC, MITSUBISHI, HEIDENHAIN, SIEMENS			
CurNcPtr	GET_nc_pointer;1,BlkPointer	Analog	Pointer of the current program
GET_othercode			
Supports CNC: FANUC, MITSUBISHI (only B code), HEIDENHAIN (only M, F, T, S code) SIEMENS			
BCode	GET_othercode;1,BCode	Analog	B-code
DCode	GET_othercode;1,DCode	Analog	D-code
FCode	GET_othercode;1,FCode	Analog	F-code
HCode	GET_othercode;1,HCode	Analog	H-code
MCode	GET_othercode;1,MCode	Analog	M-code
SCode	GET_othercode;1,SCode	Analog	S-code
TCode	GET_othercode;1,TCode	Analog	T-code
GET_part_count			
Supports CNC: FANUC, MITSUBISHI, HEIDENHAIN, SIEMENS			
PartCnt	GET_part_count;1,PartCount	Analog	Part count
GET_part_required			
Supports CNC: FANUC, MITSUBISHI, SIEMENS			
PartReq	GET_part_required;1,PartRequired	Analog	Part required
GET_part_total			
Supports CNC: FANUC			
ParTotal	GET_part_total;1,PartTotal	Analog	Total part count
GET_plc_alarm			
Supports CNC: FANUC			
PlcAlm	GET_plc_alarm;0,PlcAlm,1,AlmMsg	Text (Array)	PLC alarm message
GET_plc_ver			
Supports CNC: FANUC, MITSUBISHI			
PlcDate	GET_plc_ver;1,Date	Text	PLC version date
PlcDesig	GET_plc_ver;1,Designed	Text	PLC version designer
PlcVer	GET_plc_ver;1,Version	Text	PLC version
GET_position			
Supports CNC: FANUC, MITSUBISHI, HEIDENHAIN, SIEMENS			
AbsPos	GET_position;0,PosData,1,Abs	Analog (Array)	Absolute Axis Coordinate

Table 4.3: CNC Runtime Tag List (FANUC, MITSUBISHI, HEIDENHAIN, and SIEMENS)

AxisName	GET_position;0,Pos-Data,1,AxisName	Text (Array)	Axis name
RemDist	GET_position;0,PosData,1,Dist	Analog (Array)	Remaining axis distance
MachPos	GET_position;0,Pos-Data,1,Mach	Analog (Array)	Axis machine coordinates
RelPos	GET_position;0,PosData,1,Rel	Analog (Array)	Relative axis coordinates
AxisUnit	GET_position;0,Pos-Data,1,Unit	Text (Array)	Axis unit
GET_servo_current			
Supports CNC: FANUC			
ServCurr	GET_servo_current;0,AxisCurrent,1,Current	Analog (Array)	Load current value of each axis
GET_servo_load			
Supports CNC: FANUC, MITSUBISHI, HEIDENHAIN, SIEMENS			
SerLd01	GET_servo_load;1,ServoLoad-Percent,1,Load	Analog	Load values for each axis (%)
SerLd02	GET_servo_load;2,ServoLoad-Percent,1,Load	Analog	Load values for each axis (%)
SerLd03	GET_servo_load;3,ServoLoad-Percent,1,Load	Analog	Load values for each axis (%)
SerLd04	GET_servo_load;4,ServoLoad-Percent,1,Load	Analog	Load values for each axis (%)
SerLd05	GET_servo_load;5,ServoLoad-Percent,1,Load	Analog	Load values for each axis (%)
SerLd06	GET_servo_load;6,ServoLoad-Percent,1,Load	Analog	Load values for each axis (%)
SerLd07	GET_servo_load;7,ServoLoad-Percent,1,Load	Analog	Load values for each axis (%)
SerLd08	GET_servo_load;8,ServoLoad-Percent,1,Load	Analog	Load values for each axis (%)
SerLd09	GET_servo_load;9,ServoLoad-Percent,1,Load	Analog	Load values for each axis (%)
SerLd10	GET_servo_load;10,ServoLoadPercent,1,Load	Analog	Load values for each axis (%)
SerLd11	GET_servo_load;11,ServoLoadPercent,1,Load	Analog	Load values for each axis (%)
SerLd12	GET_servo_load;12,ServoLoadPercent,1,Load	Analog	Load values for each axis (%)
GET_servo_speed			
Supports CNC: FANUC, MITSUBISHI, HEIDENHAIN, SIEMENS			
ServSped	GET_servo_speed;0,ServoLoadPercent,1,Speed	Analog (Array)	Servo shaft speed
GET_servo_temperature			
Supports CNC: FANUC, HEIDENHAIN, SIEMENS			
ServTemp	GET_servo_temperature;0,Temperature,1,Axis-Temp	Analog (Array)	Servo motor temperature
GET_spindle_load			

Table 4.3: CNC Runtime Tag List (FANUC, MITSUBISHI, HEIDENHAIN, and SIEMENS)			
Supports CNC: FANUC, MITSUBISHI, HEIDENHAIN, SIEMENS			
SpinLoad	GET_spindle_load;1,Load	Analog	Spindle load (%)
GET_spindle_speed			
Supports CNC: FANUC, MITSUBISHI, HEIDENHAIN, SIEMENS			
SpinSped	GET_spindle_speed;1,Speed	Analog	Spindle speed
GET_spindle_temperature			
Supports CNC: FANUC, HEIDENHAIN, SIEMENS			
SpinTmp1	GET_spindle_temperature;1,Spindle_1_Temp	Analog	Temperature of Spindle 1
SpinTmp2	GET_spindle_temperature;1,Spindle_2_Temp	Analog	Temperature of Spindle 2
GET_status			
Supports CNC: FANUC, MITSUBISHI, HEIDENHAIN, SIEMENS			
Alarm	GET_status;1,Alarm	Text	Alarm
NcStatus	GET_status;1,CncStatus	Text	CNC Status (e.g., "STOP", "START")
CurPgm	GET_status;1,CurProg	Text	Current program
CurSeq	GET_status;1,CurSeq	Analog	Sequence of the current program
Emg	GET_status;1,Emg	Text	EMG
MainPgm	GET_status;1,MainProg	Text	Main program
Mode	GET_status;1,Mode	Text	e.g., "MDI", "MEM"
GET_time			
Supports CNC: FANUC, MITSUBISHI, SIEMENS			
CutHour	GET_time;1,Cutting,1,Hour	Analog	Cutting time (hours)
CutMin	GET_time;1,Cutting,1,Minuite	Analog	Cutting time (minutes)
CutSec	GET_time;1,Cutting,1,Second	Analog	Cutting time (seconds)
CycHour	GET_time;1,Cycle,1,Hour	Analog	Cycle time (hours)
CycMin	GET_time;1,Cycle,1,Minuite	Analog	Cycle time (minutes)
CycSec	GET_time;1,Cycle,1,Second	Analog	Cycle time (seconds)
OperHour	GET_time;1,Operation,1,Hour	Analog	Operation time (hours)
OperMin	GET_time;1,Operation,1,Minuite	Analog	Operation time (minutes)
OperSec	GET_time;1,Operation,1,Second	Analog	Operation time (seconds)
PowHour	GET_time;1,Power,1,Hour	Analog	Power time (hours)
PowMin	GET_time;1,Power,1,Minuite	Analog	Power time (minutes)
PowSec	GET_time;1,Power,1,Second	Analog	Power time (seconds)
GET_time_heid			
Supports CNC: HEIDENHAIN			
RunHour_H	GET_time_heid;1,MachineRunning,1,Hour	Analog	Machine run time (hours) (HEIDENHAIN)
RunMin_H	GET_time_heid;1,MachineRunning,1,Minuite	Analog	Machine run time (minutes) (HEIDENHAIN)
UpHour_H	GET_time_heid;1,MachineUp,1,Hour	Analog	Machine up time (hours) (HEIDENHAIN)

Table 4.3: CNC Runtime Tag List (FANUC, MITSUBISHI, HEIDENHAIN, and SIEMENS)

UpMin_H	GET_time_heid;1,MachineUp,1,Minute	Analog	Machine up time (minutes) (HEIDENHAIN)
NUpHour_H	GET_time_heid;1,NcUp,1,Hour	Analog	NC up time (hours) (HEIDENHAIN)
NUpMin_H	GET_time_heid;1,NcUp,1,Minute	Analog	NC up time (minutes) (HEIDENHAIN)
SRunHour_H	GET_time_heid;1,SpindleRunning,1,Hour	Analog	Spindle running time (hours) (HEIDENHAIN)
SRunMin_H	GET_time_heid;1,SpindleRunning,1,Minute	Analog	Spindle running time (minutes) (HEIDENHAIN)
GET_utilization_all_today			
Supports CNC: FANUC, MITSUBISHI, HEIDENHAIN, SIEMENS			
UtiAAIm	GET_utilization_all_today;0,Uti,1,AlarmTotal	Analog	Today machine availability: total abnormal time (hours)
UtiABusy	GET_utilization_all_today;0,Uti,1,BusyTotal	Analog	Machine availability for the current day: total busy time (hours)
UtiAIdle	GET_utilization_all_today;0,Uti,1,IdleTotal	Analog	Machine availability for the current day: total idle time (hours)
UtiAOff	GET_utilization_all_today;0,Uti,1,OffTotal	Analog	Machine availability for the current day: total off time (hours)
UtiAPTCnt	GET_utilization_all_today;0,Uti,1,PartTotal	Analog	Machine availability for the current day: total number of workpieces
UtiACyc	GET_utilization_all_today;0,Uti,1,CycleTotal	Analog	Machine availability for the current day: total number of processing cycles
GET_utilization_single_all			
Supports CNC: FANUC, MITSUBISHI, HEIDENHAIN, SIEMENS			
GetUtiS	GET_utilization_single_all;10003	Discrete	Flag (0 -> 1) from getting utilization single by the time setting UtiQST & UtiQET including UtiAlarm, UtiBusy, UtiCycle, UtiIdle, UtiOff & UtiPTCnt
UtiQST	GET_utilization_single_all;20002	Text	Single machine availability: query start time. Format is YYYY-MM-dd HH:mm:ss (input)
UtiQET	GET_utilization_single_all;20003	Text	Single machine availability: query end time. Format is YYYY-MM-dd HH:mm:ss (input)
UtiAlarm	GET_utilization_single_all;1,Uti,1,AlarmTotal	Analog	Single machine availability: total alarm time (hours)
UtiBusy	GET_utilization_single_all;1,Uti,1,BusyTotal	Analog	Single machine availability: total busy time (hours)
UtiIdle	GET_utilization_single_all;1,Uti,1,IdleTotal	Analog	Single machine availability: total idle time (hours)
UtiOff	GET_utilization_single_all;1,Uti,1,OffTotal	Analog	Single machine availability: total off time (hours)
UtiPCnt	GET_utilization_single_all;0,UtiList,1,PartCount	Analog (Array)	Single machine availability: number of workpieces
UtiCycle	GET_utilization_single_all;1,Uti,1,CycleTotal	Analog	Single machine availability: total number of processing cycles

Table 4.3: CNC Runtime Tag List (FANUC, MITSUBISHI, HEIDENHAIN, and SIEMENS)

UtiStatu	GET_utilization_single_all;0,UtiList,1,Status	Text (Array)	Single machine availability: status (OFF, IDLE, ALARM, BUSY)
UtiSTime	GET_utilization_single_all;0,UtiList,1,StDateTime	Text (Array)	Single machine availability: start time
UtiETime	GET_utilization_single_all;0,UtiList,1,EndDate-Time	Text (Array)	Single machine availability: end time
UtiTTime	GET_utilization_single_all;0,UtiList,1,TotalTime	Analog (Array)	Single machine availability: total time
UtiPCnt	GET_utilization_single_all;0,UtiList,1,PartCount	Analog (Array)	Single machine availability: number of workpieces
UtiNcPgm	GET_utilization_single_all;0,UtiList,1,NcName	Text (Array)	Single machine availability: NC program name
UtiAlmM	GET_utilization_single_all;0,UtiList,1,Alarm	Text (Array)	Single machine availability: alarm number and information
SET_nc_main			
Supports CNC: FANUC, SIEMENS			
SetMain	SET_nc_main;10011	Discrete	Flag (0 ->1) from setting a the main program as SetMainN
SetMainN	SET_nc_main;20011	Text	Set an NC program name as the main program (input)
SKY_conn_status_single			
Supports CNC: FANUC, MITSUBISHI, HEIDENHAIN, SIEMENS			
Status	SKY_conn_status_single;1,SKY_conn_status_single,1,Status	Discrete	CNC connection status 0: DISCONNECT 1: RUN (only for MEM mode) 2: IDLE 3: ALARM
UPLOAD_nc_ftp			
Supports CNC: FANUC, MITSUBISHI, SIEMENS			
UpFPgm	UPLOAD_nc_ftp;10007	Discrete	Flag (0 ->1) from uploading a NC program as UpFNc to a data server
UpFNc	UPLOAD_nc_ftp;20007	Text	The FTP server upload: NC program name (input)
UPLOAD_nc_mem			
Supports CNC: FANUC, MITSUBISHI, HEIDENHAIN, SIEMENS			
UpMPgm	UPLOAD_nc_mem;10006	Discrete	Flag (0 ->1) from uploading a NC program as UpMNc to CNC memory
UpMNc	UPLOAD_nc_mem;20006	Text	Memory upload: NC program name (input)
GET_offset_title			
Supports CNC: FANUC, MITSUBISHI			
OffTitle	GET_offset_title;0,Offset,1,Title	Text	Tool offset title
GetOTitle	GET_offset_title;10012	Discrete	Flag (0 ->1) from getting a tool offset's title as OffTitle
GET_offset_all			
Supports CNC: FANUC, MITSUBISHI			

Table 4.3: CNC Runtime Tag List (FANUC, MITSUBISHI, HEIDENHAIN, and SIEMENS)

Offset01	GET_offset_all;0,Offset,1,C0	Analog (Array)	Tool offset value (Column 1)
Offset02	GET_offset_all;0,Offset,1,C1	Analog (Array)	Tool offset value (Column 2)
Offset03	GET_offset_all;0,Offset,1,C2	Analog (Array)	Tool offset value (Column 3)
Offset04	GET_offset_all;0,Offset,1,C3	Analog (Array)	Tool offset value (Column 4)
GetOData	GET_offset_all;10013	Discrete	Flag (0 ->1) from getting all tool offset data including Offset01, Offset02, Offset03, Offset04 and etc.
SET_offset_single			
Supports CNC: FANUC, MITSUBISHI			
SetONum	SET_offset_single;20012	Analog	The number of offset data (input)
SetOVal	SET_offset_single;20013	Analog (Array)	The values offset data (input)
SetOData	SET_offset_single;10014	Discrete	Flag (0 ->1) from setting the offset data including SetONum & SetOVal
GET_macro_all			
Supports CNC: FANUC, MITSUBISHI,SIEMENS			
MacNum	GET_macro_all;0,Macro,1,MacroNumber	Analog (Array)	The number of macro data
MacData	GET_macro_all;0,Macro,1,MacroData	Analog (Array)	Macro data
GetMacro	GET_macro_all;10015	Discrete	Flag (0 ->1) from getting all macro data including MacNum & MacData
SET_macro_single			
Supports CNC: FANUC, MITSUBISHI			
SetMacNo	SET_macro_single;20014	Analog	The number of data (input)
SetMacro	SET_macro_single;20015	Analog	The values of macro data (input)
SetMData	SET_macro_single;10016	Discrete	Flag (0 ->1) from setting the macro data including SetMacNo & Set-Macro
GET_tool_table_siemens			
Supports CNC: SIEMENS			
ToolMemNo	GET_tool_table_siemens;0,ToolData;1;ToolMemoryNO	Analog (Array)	The number of tools in memory (SIEMENS)
ToolPlace	GET_tool_table_siemens;0,ToolData;1;ToolPlace	Analog (Array)	The position of tool table in memory (SIEMENS)
ToolName	GET_tool_table_siemens;0,ToolData;1,ToolName	Text (Array)	The name of a tool in memory (SIEMENS)
EdgeCnt	GET_tool_table_siemens;0,ToolData;1,EdgeCount	Analog (Array)	The edge count of a tool (SIEMENS)
GetTool	GET_tool_table_siemens;10020	Discrete	Flag (0 ->1) from getting the tool data (SIEMENS) including Tool-MemNo, ToolPlace, ToolName & EdgeCnt
GET_tool_edge_parameter_siemens			
Supports CNC: SIEMENS			

Table 4.3: CNC Runtime Tag List (FANUC, MITSUBISHI, HEIDENHAIN, and SIEMENS)

Edge1PNo	GET_tool_edge_parameter_siemens;1,EdgeData,0,ParmaData,1,ParamNO	Analog (Array)	The parameter number of first tool edge (SIEMENS)
Edge1PV	GET_tool_edge_parameter_siemens;1,EdgeData,0,ParmaData,1,Param-Value	Analog (Array)	The parameter value of first tool edge (SIEMENS)
Edge2PNo	GET_tool_edge_parameter_siemens;2,EdgeData,0,ParmaData,1,ParamNO	Analog (Array)	The parameter number of second tool edge (SIEMENS)
Edge3PNo	GET_tool_edge_parameter_siemens;3,EdgeData,0,ParmaData,1,ParamNO	Analog (Array)	The parameter number of third tool edge (SIEMENS)
ToolQMNo	GET_tool_edge_parameter_siemens;20016	Analog	The number of tool in memory (SIEMENS) (Input)
GetTEP	GET_tool_edge_parameter_siemens;10021	Discrete	Flag (0 ->1) from getting tool edge parameters including Edge1PNo, Edge2PNo, Edge3PNo & ToolQMNo
GET_plc_status2/SET_plc_status2_adv			
Supports CNC: FANUC, MITSUBISHI, HEIDENHAIN			
PlcType	GET_plc_status2;1,PlcStatus,1,PlcType;M,N (M: address, N: PLC number)	Discrete (0:byte 1:short 2:int 3:bool 4:double 5:string 6:sbyte)	Type of PLC status data address: FANUC: G, F, Y, X, A, R, T, K, C, D, E MITSUBISHI: X, Y, M, F, L, SM, D, R, W, B, SB,V, SW, SD HEIDENHAIN: M, B, W, D, I, O, T, C, S, IB, IW, ID, OB, OW, OD
PlcData	GET_plc_status2;1,PlcStatus,1,PlcDataStr;M,N (M: address, N: PLC number)	Analog (default)	The data of PLC status data PlcDataStr: PLC data(text) for all type including Byte, Short, Int, Bool, Double, String, Sbyte
GET_plc_status2_Siemens/SET_plc_status2_Siemens			
Supports CNC: SIEMENS			
PlcType	GET_plc_status2_Siemens;1,PlcStatus,1,PlcType;M,N (M: address, N: PLC number)	Discrete (0:byte 1:short 2:int 3:bool 4:double 5:string 6:sbyte)	The type of PLC status data (SIEMENS) Address: SIEMENS: I/IB/ID/IW/M/MB/MD/MM/Q/QB/QD/QW/T/DB
PlcDataS	GET_plc_status2_Siemens;1,PlcStatus,1,PlcDataStr;M,N (M: address, N: PLC number)	Analog (default)	The data of PLC status data (SIEMENS) PlcDataStr: PLC data(text) for all type including Byte, Short, Int, Bool, Double, String, Sbyte
GET_param_data			
Supports CNC: FANUC, MITSUBISHI			

Table 4.3: CNC Runtime Tag List (FANUC, MITSUBISHI, HEIDENHAIN, and SIEMENS)

ParaData	GET_param_data;1,Param-Data,0,ParamDataStr;1	Text	System parameter data
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Table 4.4: CNC Runtime Error Codes (FANUC, MITSUBISHI, HEIDENHAIN and SIEMENS)

Error Code	Error Types	Description
*[fffc]	Plug-In Time out (-20)	The function has timed out; modify the register value (FANUC only) if you want to extend the time out
*[ffed]	SkyMars Busy (-19)	SkyMars is running
*[ffee]	Not Supports (-18)	The function is not Supports for this controller
*[ffef]	Protocol error (-17)	Data from the Ethernet board is incorrect. Please check the Ethernet settings
*[fff0]	Socket error (-16)	Examine the CNC power supply, Ethernet cable, and I/F board
*[fff1]	DLL file error (-15)	There is no DLL file for each CNC series corresponding to the specified node
*[fff8]	Handle number error (-8)	Get the library handle number
*[fff9]	Version mismatch between the CNC/PMC and library (-7)	The CNC/PMC version does not match the library version. Replace the library or CNC/PMC control software
*[fffa]	Abnormal library state (-6)	An exception error has occurred with the executed library
*[fffd]	Reset or stop request (-2)	The RESET or STOP button was pressed. Call the termination function
*[fffe]	CNC Busy (-1)	Wait until after CNC processing or retry
*[8000]	WebAccess/CNC runtime is offline.	Check whether WebAccess/CNC runtime is running
*[8001]	Error(function is not executed, or not available) (1)	A specific function that should have been called has not been executed; otherwise, the function is not available
*[8002]	Error(data block length error, error of number of data) (2)	Check and correct the data block length or number of data
*[8003]	Error(data number error) (3)	Check and correct the data number
*[8004]	Error(data attribute error) (4)	Check and correct the data attribute
*[8005]	Error(data error) (5)	Check and correct the write data
*[8006]	Error(no option) (6)	There is no corresponding CNC option
*[8007]	Error(write protection) (7)	Write operation prohibited
*[8008]	Error(memory overflow) (8)	CNC tape memory overflow has occurred
*[8009]	Error(CNC parameter error) (9)	CNC parameter is incorrect
*[800a]	Error(buffer empty/full) (10)	The buffer is empty or full

Table 4.4: CNC Runtime Error Codes (FANUC, MITSUBISHI, HEIDENHAIN and SIEMENS)

*[800b]	Error(path number error) (11)	A path number is incorrect
*[800c]	Error(CNC mode error) (12)	The CNC mode is incorrect; correct the CNC mode
*[800d]	Error(CNC execution rejection) (13)	CNC execution rejected. Check the condition of execution.
*[800e]	Error(Data server error) (14)	An error has occurred no the data server
*[800f]	Error(alarm) (15)	The function cannot be executed because of a CNC alarm. Remove the cause of alarm.
*[8010]	Error(stop) (16)	CNC status is “stop” or “emergency.”
*[8011]	Error(State of data protection) (17)	Data protected by the CNC data protection function
*[8012]	Error(Not found Machine ID) (18)	Please check the connected CNC status or disable this CNC connection.
*[8013]	Error(No out) (19)	Please check the error number
*[8014]	Error(Password) (20)	Incorrect password
*[8015]	Error(Compatible) (21)	Version compatibility problem

Table 4.5: LNC CNC Driver Tag List

LNC provides the ReCon library to connect with CNC/robot controllers. There are six types of controller registers: R, C, S, A, I, O. The common registers are as follows:

Tag Name	Address	Type	Description
AbsPos	R83000	Analog (Array)	Absolute position (Axis 1~32)
DCode	R3006220	Analog	D-code
FastFwdP	R17000	Analog	Quick override(%)
FCode	R3006196	Analog	F-code
FedRateP	R17001	Analog	Feed rate override (%)
FeedRate	R82066	Analog	Feed rate
G54P1	R3094352	Analog (Array)	G54P1 Code (Axis 1~32)
GCode00	R3094000	Analog (Array)	G00 Code (Axis 1~32)
GCode54	R3094032	Analog (Array)	G54 Code (Axis 1~32)
GCode55	R3094064	Analog (Array)	G55 Code (Axis 1~32)
GCode56	R3094096	Analog (Array)	G56 Code (Axis 1~32)
GCode57	R3094128	Analog (Array)	G57 Code (Axis 1~32)
GCode58	R3094160	Analog (Array)	G58 Code (Axis 1~32)
GCode59	R00001	Analog (Array)	G59 Code (Axis 1~32)
HCode	R3006219	Analog	H-code
MachPos	R83064	Analog (Array)	The machine position (Axis 1~32)

Table 4.5: LNC CNC Driver Tag List

MCode	R3006197	Analog (Array)	M-code
NCode	R3006218	Analog	N-code
PartCnt	R17019	Analog	Part count
ParTotal	R140018	Analog (Array)	Part total count
PartSet	C0027	Analog	Part count setting
RelPos	R83032	Analog (Array)	Relative position (Axis 1~32)
SCode	R3006207	Analog (Array)	S-code
SCodeNum	R3006202	Analog (Array)	The number of S-code
SpinSpdR	R11370	Analog	Spindle speed override (%)
SpinSped	R83138	Analog	Spindle speed
TCode	R3006212	Analog	T-code
Status	R17003	Discrete	Status 0: Not Ready 1: Ready 2: Cycle Start 3: Stop 4: Hold
OperMode	R22000	Discrete	Operation mode 0: MEM 1: MDI 2: ZRN 3: MPG 4: JOG 5: INC JOG
MachType	R60000	Discrete	Machine type 0: Milling 1: Lathe 2: Manipulator 3: Punch 4: Automation
SysUnit	R69001	Discrete	The minimal unit of system command 0: 1 μ m 1: 10 μ m 2: 0.1 μ m 3: 0.01 μ m
UnitType	R69042	Discrete	The type of system unit 0: Metric 1: Imperial
IsFinish	S0027	Discrete	Part count is finished or not
IsArrive	S0098	Discrete	Part count is arrived at the total count or not
IsMsg	S3001	Discrete	Exists warning message or not
IsAlarm	S3000	Discrete	Exists alarm or not
AlmMsg	R1790010-31;40	Text (Array)	The alarm message
AlmNo	R1790001-4;40	Text (Array)	The number of message

Table 4.5: LNC CNC Driver Tag List

AlmTime	R1790005-5,40	Text (Array)	The time of alarm message
MASTATUS	MASTATUS	Discrete	CNC connection status 0: DISCONNECT 1: RUN (only for MEM mode) 2: IDLE 3: ALARM

Table 4.6: LNC CNC Driver Error Codes

Error Code	Error Types	Description
*[ffff]	System error (driver not loaded)	ReCon lib driver is not loaded
*[8000]	Device is offline	Check LNC device is alive or not
0x8001	RunExeFail	Failed to run exe file
0x8002	WrongTagAddress	The tag address is wrong
0x8003	MapFail	Internal error
0x8004	Init	Initialization failed
0x8101	LibInitFail	Library initialization failed
0x8102	ConnectCmdFail	Connection command failed
0x8103	NoConnection	No connection
0x8104	ReadTimeout	Read timeout

Table 4.7: brother CNC Driver Tag List

Tag Name	Address	Type	Description
AlarmCur	01:0000:E01:00000	Text (Array)	Current alarm array (for C00, D00)
PCCounA1	01:0001:A01:00000	Analog	PCounter A01 count value (NC)
PCCurA1	01:0001:A01:00001	Analog	PCounter A01 current value (NC)
PCTarA1	01:0001:A01:00002	Analog	PCounter A01 target value (NC)
PCNoteA1	01:0001:A01:00003	Analog	PCounter A01 notice value (NC)
PCCounA2	01:0001:A02:00000	Analog	PCounter A02 count value (NC)
PCCurA2	01:0001:A02:00001	Analog	PCounter A02 current value (NC)
PCTarA2	01:0001:A02:00002	Analog	PCounter A02 target value (NC)
PCNoteA2	01:0001:A02:00003	Analog	PCounter A02 notice value (NC)
PCCounA3	01:0001:A03:00000	Analog	PCounter A03 count value (NC)
PCCurA3	01:0001:A03:00001	Analog	PCounter A03 current value (NC)
PCTarA3	01:0001:A03:00002	Analog	PCounter A03 target value (NC)
PCNoteA3	01:0001:A03:00003	Analog	PCounter A03 notice value (NC)
PCCounA4	01:0001:A04:00000	Analog	PCounter A04 count value (NC)
PCCurA4	01:0001:A04:00001	Analog	PCounter A04 current value (NC)
PCTarA4	01:0001:A04:00002	Analog	PCounter A04 target value (NC)
PCNoteA4	01:0001:A04:00003	Analog	PCounter A04 notice value (NC)
PCCounB1	01:0001:B01:00000	Analog	PCounter B01 count value (Conversation)
PCCurB1	01:0001:B01:00001	Analog	PCounter B01 current value (Conversation)
PCTarB1	01:0001:B01:00002	Analog	PCounter B01 target value (Conversation)
PCNoteB1	01:0001:B01:00003	Analog	PCounter B01 notice value (Conversation)

Table 4.7: brother CNC Driver Tag List

PCCounB2	01:0001:B02:00000	Analog	PCounter B02 count value (Conversation)
PCCurB2	01:0001:B02:00001	Analog	PCounter B02 current value (Conversation)
PCTarB2	01:0001:B02:00002	Analog	PCounter B02 target value (Conversation)
PCNoteB2	01:0001:B02:00003	Analog	PCounter B02 notice value (Conversation)
PCCounB3	01:0001:B03:00000	Analog	PCounter B03 count value (Conversation)
PCCurAB3	01:0001:B03:00001	Analog	PCounter B03 current value (Conversation)
PCTarB3	01:0001:B03:00002	Analog	PCounter B03 target value (Conversation)
PCNoteB3	01:0001:B03:00003	Analog	PCounter B03 notice value (Conversation)
PCCounB4	01:0001:B04:00000	Analog	PCounter B04 count value (Conversation)
PCCurB4	01:0001:B04:00001	Analog	PCounter B04 current value (Conversation)
PCTarB4	01:0001:B04:00002	Analog	PCounter B04 target value (Conversation)
PCNoteB4	01:0001:B04:00003	Analog	PCounter B04 notice value (Conversation)
MState	01:0002:C01:1	Discrete	Machine state (for B00, C00) 0:Power off, 1:Stand by, 2:Running, 3:Stopped, 4>Error
ErrCode	01:0002:C01:3:eno	Text	Machine error code (for B00, C00)
RunProg	01:0002:C01:3:pno	Text	Running program number (for B00, C00)
MStateD	01:0012:C01:1	Discrete	Machine state (for D00) 0:Power off, 1:Stand by, 2:Running, 3:Stopped, 4>Error
ErrCodeD	01:0002:C01:3:eno	Text	Machine error code (for D00)
RunProgD	01:0002:C01:3:pno	Text	Running program number (for D00)
Gcode	01:0004:G01:00000	Text (array)	G code array
Mcode	01:0004:M01:00000	Text (Array)	M code array
PosMac	01:0004:P01:00000	Analog (Array)	Machine axis position array
PosRel	01:0004:P02:00000	Analog (Array)	Relative axis position array
PosAbs	01:0004:P03:00000	Analog (Array)	Absolute axis position array
PosRem	01:0004:P04:00000	Analog (Array)	Remain axis position array
ActFeed	01:0004:X01:00000	Analog	Actual feedrate
ActSpin	01:0004:X01:00001	Analog	Actual spindle speed
InnerWbS	01:0004:X01:00002	Discrete	Inner workbench 0:QT Uninstall, 1:Workbench1, 2:Workbench2
TLNo	01:0004:X01:00003	Text	Spindle tool number
TLName	99:0011:XX:00000	Text	Current tool name
TLNoNext	01:0004:X01:00004	Text	Next tool number
TLSlotNo	01:0004:X01:00005	Text	Tool slot number
DoorInLk	01:0004:X01:00006	Discrete	Door Interlock status 0: OFF, 1: ON

Table 4.7: brother CNC Driver Tag List			
DoorOut	01:0004:X01:00007	Discrete	Outdoor status 0:Close, 1:Open
DoorInne	01:0004:X01:00008	Discrete	Inner door status 0:Close, 1:Open
DoorSide	01:0004:X01:00009	Discrete	Side door status 0:Close, 1:Open
OvQuick	01:0004:X01:00010	Analog	Quickoverride 0: speed1, 1: speed2, 2: speed3, 3: speed4 , 4: 100%, 5: 0%
OvFeed	01:0004:X01:00011	Analog	Feed override(%)
OvSpin	01:0004:X01:00012	Analog	Spindle override(%)
Mcr500	01:0007:C500:00000	Analog	Macro 500 value (R/W)
Mcr500A	01:0007:Cxxx:00000	Analog (Array)	Macro 500-999 array (R/W)
Mode	01:0008:K01:00000	Discrete	Operation mode 0:Manual, 1:MDI, 2:MEM, 3:Program Edit 4:MDI Manual, 5:Operation
Monitor	01:0008:K01:00001	Analog	Monitor status (Monitor.extvt0) 0:Shutdown, 1:Alarm, 2:Database, 3:ATC 4:Program, 5:Manual, 6:Postion, 7:I/O 8:Monitor, 9:Graphic
Progskip	01:0008:K01:00002	Discrete	Skip the program 0: OFF, 1: ON
ChooStop	01:0008:K01:00003	Discrete	Choose to stop 0: OFF, 1: ON
EmptyOp	01:0008:K01:00005	Discrete	Empty operation 0: OFF, 1: ON
Mlock	01:0008:K01:00006	Discrete	Machine lock 0: OFF, 1: ON
CoolPump	01:0008:K01:00007	Discrete	Cooler pump 0: OFF, 1: ON
Flush	01:0008:K01:00008	Discrete	Flush 0: OFF, 1: ON
Light	01:0008:K01:00009	Discrete	Machine light 0: OFF, 1: ON
WBChoose	01:0008:K01:00010	Discrete	Workbench choose 0: OFF, 1: ON, 1:1, 2:2, 3:1-2
Emergen	01:0008:S01:00003	Discrete	Emergency 0: OFF, 1: ON
Datalock	01:0008:S01:00005	Discrete	Data lock 0:Enable, 1:Disable
Mtype	01:0009:M01:00000	Text	Machine Type

Table 4.7: brother CNC Driver Tag List

MAC	01:0009:S01:00000	Text	Machine ID
Version	01:0009:V01:00000	Text	Machine version
GetAlmF	99:0000:XX:00000	Discrete	Flag (0 ->1) from getting the alarm log including GetAlmC & GetAlmD
GetAlmC	99:0001:XX:00000	Text (Array)	Get alarm log code array
GetAlmD	99:0002:XX:00000	Text (Array)	Get alarm log date array
ToInmF	99:0003:XX:00000	Discrete	Flag (0 ->1) from getting the tool info including T01 & Txx (LnOff, LnWCp, DiCp, DiWCp, LfIni, LfNot, LfCur & Name)
T01LnOff	99:0005:T01:00000	Analog	1st tool length offset
T01LnWCp	99:0005:T01:00001	Analog	1st tool length wear compensation
T01DiCp	99:0005:T01:00002	Analog	1st tool diameter compensation
T01DiWCp	99:0005:T01:00003	Analog	1st tool diameter wear compensation
T01LfIni	99:0005:T01:00005	Analog	1st tool initial life
T01LfNot	99:0005:T01:00006	Analog	1st tool notice life
T01LfCur	99:0005:T01:00007	Analog	1st tool current life
T01Name	99:0005:T01:00008	Text	1st tool name
TxxLnOff	99:0005:TXx:00000	Analog (Array)	All tool length offset by array
TxxLnWCp	99:0005:TXx:00001	Analog (Array)	All tool length wear compensation by array
TxxDiCp	99:0005:TXx:00002	Analog (Array)	All tool diameter compensation by array
TxxDiWCp	99:0005:TXx:00003	Analog (Array)	All tool diameter wear compensation by array
TxxLfIni	99:0005:TXx:00005	Analog (Array)	All tool initial life by array
TxxLfNot	99:0005:TXx:00006	Analog (Array)	All tool notice life by array
TxxLfCur	99:0005:TXx:00007	Analog (Array)	All tool current life by array
TxxName	99:0005:TXx:00008	Text (Array)	All tool name by array
PosnmF	99:0004:XX:00000	Discrete	Flag (0 ->1) from getting the postion info including work coordinate G54~G59, GEXT & G5401~G5448
WCG54	99:0006:G54:00000	Analog (Array)	Work coordinate G54
WCG55	99:0006:G55:00000	Analog (Array)	Work coordinate G55
WCG56	99:0006:G56:00000	Analog (Array)	Work coordinate G56
WCG57	99:0006:G57:00000	Analog (Array)	Work coordinate G57
WCG58	99:0006:G58:00000	Analog (Array)	Work coordinate G58
WCG59	99:0006:G59:00000	Analog (Array)	Work coordinate G59

Table 4.7: brother CNC Driver Tag List			
WCGEXT	99:0006:H01:00000	Analog (Array)	Work coordinate extension
WCG5401	99:0006:X01:00000	Analog (Array)	Work coordinate G54.01
WCG5402	99:0006:X02:00000	Analog (Array)	Work coordinate G54.02
WCG5403	99:0006:X03:00000	Analog (Array)	Work coordinate G54.03
WCG5404	99:0006:X04:00000	Analog (Array)	Work coordinate G54.04
WCG5405	99:0006:X05:00000	Analog (Array)	Work coordinate G54.05
WCG5406	99:0006:X06:00000	Analog (Array)	Work coordinate G54.06
WCG5407	99:0006:X07:00000	Analog (Array)	Work coordinate G54.07
WCG5408	99:0006:X08:00000	Analog (Array)	Work coordinate G54.08
WCG5409	99:0006:X09:00000	Analog (Array)	Work coordinate G54.09
WCG5410	99:0006:X10:00000	Analog (Array)	Work coordinate G54.10
WCG5411	99:0006:X11:00000	Analog (Array)	Work coordinate G54.11
WCG5412	99:0006:X12:00000	Analog (Array)	Work coordinate G54.12
WCG5413	99:0006:X13:00000	Analog (Array)	Work coordinate G54.13
WCG5414	99:0006:X14:00000	Analog (Array)	Work coordinate G54.14
WCG5415	99:0006:X15:00000	Analog (Array)	Work coordinate G54.15
WCG5416	99:0006:X16:00000	Analog (Array)	Work coordinate G54.16
WCG5417	99:0006:X17:00000	Analog (Array)	Work coordinate G54.17
WCG5418	99:0006:X18:00000	Analog (Array)	Work coordinate G54.18
WCG5419	99:0006:X19:00000	Analog (Array)	Work coordinate G54.19
WCG5420	99:0006:X20:00000	Analog (Array)	Work coordinate G54.20
WCG5421	99:0006:X21:00000	Analog (Array)	Work coordinate G54.21
WCG5422	99:0006:X22:00000	Analog (Array)	Work coordinate G54.22
WCG5423	99:0006:X23:00000	Analog (Array)	Work coordinate G54.23
WCG5424	99:0006:X24:00000	Analog (Array)	Work coordinate G54.24
WCG5425	99:0006:X25:00000	Analog (Array)	Work coordinate G54.25

Table 4.7: brother CNC Driver Tag List			
WCG5426	99:0006:X26:00000	Analog (Array)	Work coordinate G54.26
WCG5427	99:0006:X27:00000	Analog (Array)	Work coordinate G54.27
WCG5428	99:0006:X28:00000	Analog (Array)	Work coordinate G54.28
WCG5429	99:0006:X29:00000	Analog (Array)	Work coordinate G54.29
WCG5430	99:0006:X30:00000	Analog (Array)	Work coordinate G54.30
WCG5431	99:0006:X31:00000	Analog (Array)	Work coordinate G54.31
WCG5432	99:0006:X32:00000	Analog (Array)	Work coordinate G54.32
WCG5433	99:0006:X33:00000	Analog (Array)	Work coordinate G54.33
WCG5434	99:0006:X34:00000	Analog (Array)	Work coordinate G54.34
WCG5435	99:0006:X35:00000	Analog (Array)	Work coordinate G54.35
WCG5436	99:0006:X36:00000	Analog (Array)	Work coordinate G54.36
WCG5437	99:0006:X37:00000	Analog (Array)	Work coordinate G54.37
WCG5438	99:0006:X38:00000	Analog (Array)	Work coordinate G54.38
WCG5439	99:0006:X39:00000	Analog (Array)	Work coordinate G54.39
WCG5440	99:0006:X40:00000	Analog (Array)	Work coordinate G54.40
WCG5441	99:0006:X41:00000	Analog (Array)	Work coordinate G54.41
WCG5442	99:0006:X42:00000	Analog (Array)	Work coordinate G54.42
WCG5443	99:0006:X43:00000	Analog (Array)	Work coordinate G54.43
WCG5444	99:0006:X44:00000	Analog (Array)	Work coordinate G54.44
WCG5445	99:0006:X45:00000	Analog (Array)	Work coordinate G54.45
WCG5446	99:0006:X46:00000	Analog (Array)	Work coordinate G54.46
WCG5447	99:0006:X47:00000	Analog (Array)	Work coordinate G54.47
WCG5448	99:0006:X48:00000	Analog (Array)	Work coordinate G54.48
TimeFlag	99:0009:XX:00000	Discrete	Flag (0 ->1) from getting the time data including TimeAOP, TimePow, TimeOP
TimeAOP	99:0010:T01:00000	Analog	Total operation time
TimePow	99:0010:T01:00001	Analog	Power on time
TimeOP	99:0010:T01:00002	Analog	Operation time

Table 4.7: brother CNC Driver Tag List			
TimeCyc	01:0011:L01:00002	Analog	Cycle time (L01:00000 or L01:00002) (for C00)
TimeCut	01:0011:L01:00003	Analog	Cut time (L01:00001 or L01:00003) (for C00)
TimeCycD	01:0013:L01:00000	Analog	Cycle time (L01:00000 or L01:00002) (for D00)
TimeCutD	01:0013:L01:00001	Analog	Cut time (L01:00001 or L01:00003) (for D00)
curncrmk	03:0000:rmk:00000: (keywords)	Text	Get the remark content of the NC file according to the keywords
curncblk	03:0000:blk:00000	Text (Array)	Get the content of the currently running program blocks
reddate	03:0001:XX:00000	Text	Get date & time (for C00, D00)
IOsignal	08:0000:XX:00000:TO OL	Discrete	Get/Write the external I/O by the signal name as "TOOL"
redplcd	03:0002:XX:00000:BX ,3FF	Analog	Get PLC signal by the signal type and number as "BX" & "3FF"

Table 4.8: brother CNC Driver Error Codes		
Error Code	Error Types	Description
*[8000]	No available data for this tag now	Check the address of this tag
*[8010]	Address of this tag is not legal	Check the first two parts of the address of this tag
*[8001]~ [8004]	Internal error	
*[8100]	No available data for this tag now	Get the value after trig the relative flag
*[8200]	No connection now	Check the connection status
*[8404]	No support function	Check the CNC setting and communication package
*[9000]	No available data for this tag now	The communication is abnormal and the driver is trying to reconnect to the device

Table 4.9: FANUC CNC Driver Tag List

Tag Name	Address	Type	Description
posabs_0	posabs_0	Analog	Read 1st absolute position information
posmac_0	posmac_0	Analog	Read 1st machine position information
posrel_0	posrel_0	Analog	Read 1st relative position information
posdis_0	posdis_0	Analog	Read 1st distance to go information
posabsar	posabsar	Analog (Array)	Read all absolute position information by array
posmacar	posmacar	Analog (Array)	Read all machine position information by array
posrelar	posrelar	Analog (Array)	Read all relative position information by array
posdisar	posdisar	Analog (Array)	Read all distance to go information by array
tmmode	tmmode	Discrete	T/M mode selection 0: T mode 1: M mode
ncstatus	ncstatus	Discrete	Status of automatic operation 0: ****(reset) 1: STOP 2: HOLD 3: START 4: MSTR (during retraction and re-positioning of tool retraction and recovery, and operation of JOG MDI)
alarmsta	alarmsta	Analog	Status of alarm (alarmsta.extvt0) 0: ***(Others) 1: Alarm 2: Battery low 3: FAN(NC or Servo amplifier) 4: PS Warning 5: FSSB warning 6: Insulate warning 7: Encoder warning 8: PMC alarm
emergen	emergen	Discrete	Status of emergency 0: (Not emergency) 1: Emergency 2: Reset 3: Wait(FS35i only)
axissta	axissta	Discrete	Status of axis 0: *** 1: Motion 2: Dwell

Table 4.9: FANUC CNC Driver Tag List			
mode	mode	Analog	AUTOMATIC/MANUAL mode selection (mode.extvt0) 0: MDI 1: Memory 2: **** 3: EDIT 4: Handle 5: JOG 6: Teach in JOG 7: Teach in Handle 8: INC feed 9: Reference 10: Remote
axismax	axismax	Analog	Maximum controlled axes
cnctype	cnctype	Text	Type of CNC
mttype	mttype	Text	Type of M/T
series	series	Text	Series number of CNC
version	version	Text	Version number of CNC
addinfo	addinfo	Analog	Read additional information
axescur	axescur	Analog	Current controlled axes
actfeed	actfeed	Analog	Read actual axis feed rate(F)
actspin	actspin	Analog	Read actual spindle speed(S)
ovfeed	ovfeed	Analog	Read feed rate override
ovspin	ovspin	Analog	Read spindle speed override
mainprog	mainprog	Text	Read main program number (modal O number)
runprog	runprog	Text	Read currently program number (modal O number)
runseq	runseq	Text	Read the currently sequence number of the NC program(Nxxxx)
progname	progname	Text	Read the program name being executed.
isalarm	isalarm	Discrete	Status of alarm 0: No alarm 1: Alarm
almclass	almclass	Text (Array)	Read the alarm status of CNC
almcode	almcode	Text (Array)	Read the alarm code
almmsg	almmsg	Text (Array)	Read the alarm message
gethalm	gethalm	Discrete	Flag (0 ->1) from getting a history alarm including almclash, almcodeh, almdateh & almmsggh
almclash	almclash	Analog (Array)	Read history alarm class Only for CNC Series 30i, 0i-D/F
almcodeh	almcodeh	Analog (Array)	Read history alarm code
almdateh	almdateh	Text (Array)	Read history alarm date
almmsggh	almmsggh	Text (Array)	Read history alarm message
pathname	pathname	Text	Read full path name of the program Only for CNC Series 30i, 0i-D/F

Table 4.9: FANUC CNC Driver Tag List

axisname	axisname	Text (Array)	Read axis name
axisunit	axisunit	Text (Array)	Read unit of position data
gcode	gcode	Text (Array)	Read all data of G code at a time
hcode	hcode	Analog	Read data of H code at a time
fcode	fcode	Analog	Read data of F code at a time
tcode	tcode	Analog	Read data of T code at a time
dcode	dcode	Analog	Read data of D code at a time
scode	scode	Analog	Read data of S code at a time
mcode	mcode	Analog	Read data of M code at a time
regprg	regprg	Analog	Number of registered programs
unregprg	unregprg	Analog	Number of available programs
usemem	usemem	Analog	Character number of used memory
unusemem	unusemem	Analog	Read the management data already registered
ptotal	ptotal	Analog	Read total part count
prequired	prequired	Analog	Read required part count
pcount	pcount	Analog	Read part count
powhour	powhour	Analog	Read power time (hours)
powmin	powmin	Analog	Read power time (minutes)
cuthour	cuthour	Analog	Read cutting time (hours)
cutmin	cutmin	Analog	Read cutting time (minutes)
cutsec	cutsec	Analog	Read cutting time (seconds)
cychour	cychour	Analog	Read cycle time (hours)
cycmin	cycmin	Analog	Read cycle time (minutes)
cycsec	cycsec	Analog	Read cycle time (seconds)
operhour	operhour	Analog	Read operation time (hours)
opermin	opermin	Analog	Read operation time (minutes)
opersec	opersec	Analog	Read operation time (seconds)
sysyear	sysyear	Analog	Read system (calendar) time (year)
sysmonth	sysmonth	Analog	Read system (calendar) time (month)
sysdate	sysdate	Analog	Read system (calendar) time (date)
syshour	syshour	Analog	Read system (calendar) time (hours)
sysmin	sysmin	Analog	Read system (calendar) time (minutes)
syssec	syssec	Analog	Read system (calendar) time (seconds)
servcurr	servcurr	Analog (Array)	Read real current for servo adjustment
servampe	servampe	Analog (Array)	Read servo load current (Ampere unit) Only for CNC Series 30i, 0i-D/F
servsped	servsped	Analog (Array)	Read real speed for servo adjustment
motosped	motosped	Analog (Array)	Read the spindle motor speed
spinsped	spinsped	Analog	Read the spindle speed
servload	servload	Analog (Array)	Read servo load meter (%)
spinload	spinload	Analog (Array)	Read spindle load meter (%)

Table 4.9: FANUC CNC Driver Tag List			
servtemp	servtemp	Analog (Array)	Read servo temperature
spintemp	spintemp	Analog (Array)	Read spindle temperature
getmacro	getmacro	Discrete	Flag (0 ->1) from getting macro variables including macdata & macnum & macdata2
macdata	macdata	Analog (Array)	Read custom macro data
macdata2	macdatabyindex	Analog (Array)	Read the macro data of the macro number
macnum	macnum	Analog (Array)	Read custom macro number
setmacro	setmacro	Discrete	Flag (0 ->1) from setting a macro variable including setmdata & setmacno
setmdata	setmdata	Analog	Set custom macro data
setmacno	setmacno	Analog	Set custom macro number
gethmsg	gethmsg	Discrete	Flag (0 ->1) from getting a history operation message including msgcodeh, msgdateh & msgtexth
msgcodeh	msgcodeh	Text (Array)	Read history operation message code
msgdateh	msgdateh	Text (Array)	Read history operation message date
msgtexth	msgtexth	Text (Array)	Read history operation message text
getwcord	getwcord	Discrete	Flag (0 ->1) from getting all work coordinates including EXT & G54~G59
wc_ext	wc_ext	Analog (Array)	Read EXT work coordinates data
wc_g54	wc_g54	Analog (Array)	Read G54 work coordinates data
wc_g55	wc_g55	Analog (Array)	Read G55 work coordinates data
wc_g56	wc_g56	Analog (Array)	Read G56 work coordinates data
wc_g57	wc_g57	Analog (Array)	Read G57 work coordinates data
wc_g58	wc_g58	Analog (Array)	Read G58 work coordinates data
wc_g59	wc_g59	Analog (Array)	Read G59 work coordinates data
getodata	getodata	Discrete	Flag (0 ->1) from getting all tool offset data including offtitle, offset_0, offset_1, offset_2, offset_3, offset_4, offset_5, offset_6 & offset_7
setodata	setodata	Discrete	Flag (0->1) from setting all tool offset data
offtitle	offtitle	Text (Array)	Reads tool offset's title
offset_0	offset_0	Analog (Array)	Read tool offset value (Column 0)
offset_1	offset_1	Analog (Array)	Read tool offset value (Column 1)

Table 4.9: FANUC CNC Driver Tag List

offset_2	offset_2	Analog (Array)	Read tool offset value (Column 2)
offset_3	offset_3	Analog (Array)	Read tool offset value (Column 3)
offset_4	offset_4	Analog (Array)	Read tool offset value (Column 4)
offset_5	offset_5	Analog (Array)	Read tool offset value. (Column 5)
offset_6	offset_6	Analog (Array)	Read tool offset value. (Column 6)
offset_7	offset_7	Analog (Array)	Read tool offset value (Column 7)
offset_8	offset_8	Analog (Array)	Read tool offset value (Column 8)
plc_ta	plc_ta_d	Analog	Read/write the PLC data of the specified PMC address t: type (G, F, Y, X, A, R, T, K, C, D, M, N, E, Z) a: address d: data type 0: byte type 1: word type 2: long type 4: 32 bit floating point type (30i-B series/0i-F/PMi-A only) 5: 64 bit floating point type (30i-B series/0i-F/PMi-A only) Please modify the correct start bit and length in the tag's attribute according to the data type as Tag name: plc_g9_1 (G9.1) Address: plc_g9_0
blkpoint	blkpoint	Analog	Read the actual execution pointer
setmain	setmain	Discrete	Flag (0 ->1) from setting a main program as set-mainn
setmainn	setmainn	Text	Set a NC program name as the main program (input) Only for CNC Series 30i, 0i-D/F
compound	addinfo	Discrete	Compound machining function
iseries	addinfo	Discrete	i Series
transfer	addinfo	Discrete	Transfer line function
loader	addinfo	Discrete	Loader control function
model	addinfo	Discrete	Model information only for 0i-D/F
getmlist	getmlist	Discrete	Flag (0 ->1) from getting the NC program list from CNC memory including mnctime, mnc-name, mncsize & mncrmk
mnctime	mnctime	Text (Array)	Read NC program modification date from CNC memory
mncname	mncname	Text (Array)	Read NC program name from CNC memory
mncsize	mncsize	Analog (Array)	Read NC program size (Bytes) from CNC memory
mncrmk	mncrmk	Text	Read NC program remark

Table 4.9: FANUC CNC Driver Tag List			
upmpgm	upmpgm	Discrete	Flag (0 ->1) from uploading a NC program as upmnc to CNC memory according to the destination directory as upmncdir
upmnc	upmnc	Text	The upload file name of a NC program (input)
upmncdir	upmncdir	Text	The destination directory for an uploaded NC program (input)
getmpgm	getmpgm	Discrete	Flag (0 ->1) from getting a NC program as mqnc from CNC memory
mqnc	mqnc	Text	NC program name or the name with the path from memory(input). EX 1: O1234 or SAMPLE EX 2: //CNC_MEM/USER/PATH1/O1111 EX 3: //CNC_MEM/USER/PATH2/O2222
delmpgm	delmpgm	Discrete	Flag (0->1) from deleting a NC program as delpgm from CNC memory
delmname	delmname	Text	The deleted (CNC memory) NC program name (input)
getlilst	getlilst	Discrete	Flag (0 ->1) from getting the NC program list from the local disk including Inctime, Incname & Incsize
Inctime	Inctime	Text (Array)	Read NC program modification date
Incname	Incname	Text (Array)	Read NC program name
Incsize	Incsize	Analog (Array)	Read NC program size (Bytes)
dellpgm	dellpgm	Discrete	Flag (0->1) from deleting a NC program as dellpgm from the local disk
dellname	dellname	Text	The deleted (local disk) NC program name (input)
curncblk	curncblk	Text	Get the content of the currently running program blocks
curncptr	curncptr	Analog	Pointer of the current program
msgcode	msgcode	Analog	Operation message code
ismsg	ismsg	Discrete	Message status
prtsa	macsysdata.3901	Analog	Macro System Variable: Number of Parts (R/W). Both common variable (#100,...,#999) and system variable (#1000,...,#9999) are supported.
prtsn	macsysdata.3902	Analog	Macro System Variable: Number of Required Parts (R/W). Both common variable (#100,...,#999) and system variable (#1000,...,#9999) are supported.
userrmk	userrmk-keywords	Text	Read the remark content of the NC file according to the keywords
runrmk	runrmk	Text	Read runprog's comment (getmlist=1 must be executed first if any files changed in memory)
MASTATUS	MASTATUS	Discrete	CNC connection status 0: DISCONNECT 1: RUN (only for MEM mode) 2: IDLE 3: ALARM
path_no	path_no	Analog	Path number of multi-path (R/W)
getCR	getCR	Discrete	Flag (0 -> 1) from getting corner R (Series 30i)

Table 4.9: FANUC CNC Driver Tag List

offtiCR	offtiCR	Text	Reads corner R's title
offCR_0	offCR_0	Analog (Array)	Reads corner R value (Column 0)
offCR_1	offCR_1	Analog (Array)	Reads corner R value (Column 1)
geto1g2	geto1g2	Discrete	Flag (0 -> 1) from getting second geometry
offti1g2	offti1g2	Text	Reads second geometry's title
off1g2_0	off1g2_0	Analog (Array)	Read second geometry value (Column 0)
off1g2_1	off1g2_1	Analog (Array)	Read second geometry value (Column 1)
off1g2_2	off1g2_2	Analog (Array)	Read second geometry value (Column 2)
geto2g2	geto2g2	Discrete	Flag (0 -> 1) from getting 2nd coord.'s 2nd geometry (Series 30i)
offti2g2	offti2g2	Text	Reads 2nd coord.'s 2nd geometry's title
off2g2_0	off2g2_0	Analog (Array)	Reads 2nd coord.'s 2nd geometry value (Column 0)
off2g2_1	off2g2_1	Analog (Array)	Reads 2nd coord.'s 2nd geometry value (Column 1)
off2g2_2	off2g2_2	Analog (Array)	Reads 2nd coord.'s 2nd geometry value (Column 2)
TG1_LT	TG1_LT	Discrete	Life type of tool group1 (R/W)
TG1_LS	TG1_LS	Analog	Life setting value of tool group1 (R/W)
TG1_CT	TG1_CT	Analog	Life counter of tool group1 (R/W)
TG1_TN	TG1_TN	Analog	Total tool number of tool group1
TG1_ST	TG1_ST	Discrete (Array)	State of tool group1
TG1_TC	TG1_TC	Analog (Array)	T code of tool group1
TG1_HC	TG1_HC	Analog (Array)	H code of tool group1
TG1_DC	TG1_DC	Analog (Array)	D code of tool group1
gethisop	gethisop	Discrete	Flag (0 ->1) from getting a history operation record file at the relative folder as ../Project name_Node name/pgm/Device name/

Table 4.10: FANUC CNC Driver Error Codes

Error Code	Error Types	Description
*[80a0]	The tag value is empty	Data tag is empty as a result of specific tag has not written to 1 yet
*[8016]	Socket error	Examine the CNC power supply, Ethernet cable, and I/F board
*[8017]	Data from Ethernet Board is incorrect	Check the Ethernet board setting
*[8001]	Not executed or not available	Specific function that must be executed beforehand has not been executed; otherwise, that function is unavailable
*[8006]	No option	There is no corresponding CNC option
*[8012]	CNC mode error	Correct the CNC mode
*[e000]	No focus library files	Please legally obtain the files: fwlibe1.dll & fwlib32.dll and put dll files in "webaccess/node/.."
Q Code	Error Types	Description
7EEE	Array size error	Array size does not match

Table 4.11: Haas CNC Driver Tag List (Haas)

Tag Name	Address	Type	Description
SN	Q100	Text	Machine serial number
Version	Q101	Text	Control software version
MN	Q102	Text	Machine model number
Mode	Q104	Text	Mode (LIST, PROG, MDI, MEM, etc.)
ToolChs	Q200	Analog	Tool changes (Total)
ToolNum	Q201	Analog	Tool number in use
TimePow	Q300	Text	Power on time (Total)
TimeMot	Q301	Text	Motion time (Total)
TimeLCy	Q303	Text	Last cycle time
TimePCy	Q304	Text	Previous cycle time
PCount1	Q402	Analog	M30 parts counter #1 (Reset at Control)
PCount2	Q403	Analog	M30 parts counter #2 (Reset at Control)
RunProg	Q500.1	Text	Running program number
Status	Q500.2	Text	Machine status IDLE/BUSY/ALARM ON
Parts	Q500.4	Analog	Total parts counter
Mac001	Q600 1	Analog	Macro #1 (ex: #1~#33)
Mac10000	Q600 10000	Analog	Macro #10000 (ex: #10000~#10999)
Spinload	Q600 1098	Analog	Spindle load
Spinsped	Q600 3027	Analog	Spindle speed
MASTATUS	MASTATUS	Discrete	CNC connection status 0: DISCONNECT 1: RUN (only for MEM mode) 2: IDLE 3: ALARM

Note: When the user need to get the correct MASTATUS, Q301 must be configured and the sampling time is larger than the change of Q301's second counter.

Table 4.12: Haas CNC Driver Error Codes

Error Code	Description
0x8002	Index error or comma error
0x8004	Fail to convert to analog value
0x8100	Illegal tag address
0x8101	COM port error
0x8102	COM port error
0x8104	Unexpected response
0x8200	Illegal tag address
0x8202	TCP connection error
0x8205	Unexpected response

Table 4.13: SYNTEC CNC OPC UA Driver Tag List

Tag Name	Address	Type	Description
Isalarm	2:1:1:MACHINE/READ/CNCA-LARM?ISALARM	Discrete	Alarm status
AlarmCur	2:1:1:MACHINE/READ/CNCA-LARM?CURRENTALARM	Text	Current alarm
Almdateh	2:1:1:MACHINE/READ/CNCA-LARM?ALARMHISTORY (conversion code: Almdateh)	Text (Array)	Read history alarm date by array
Almcodeh	2:1:1:MACHINE/READ/CNCA-LARM?ALARMHISTORY (conversion code: Almcodeh)	Text (Array)	Read history alarm code by array
Almmsggh	2:1:1:MACHINE/READ/CNCA-LARM?ALARMHISTORY (conversion code: Almmsggh)	Text (Array)	Read history alarm message by array
Almduth	2:1:1:MACHINE/READ/CNCA-LARM?ALARMHISTORY (conversion code: Almduth)	Text (Array)	Read history alarm duration by array
Almclrh	2:1:1:MACHINE/READ/CNCA-LARM?ALARMHISTORY (conversion code: almclrh)	Text (Array)	Read history alarm clear by array
ActFeed	2:1:1:MACHINE/READ/CNC-CHANNEL?ACTFEEDRATE	Analog	Actual feed rate
OvFeed	2:1:1:MACHINE/READ/CNC-CHANNEL?ACTOVERRIDE	Analog	Feed override
RunSeq	2:1:1:MACHINE/READ/CNC-CHANNEL?ACTMAINPROGRAMLINE	Analog	The currently sequence number of the NC program
ProName	2:1:1:MACHINE/READ/CNC-CHANNEL?ACTMAINPROGRAMNAME	Text	The program name being executed
Mstate	2:1:1:MACHINE/READ/CNC-CHANNEL?ACTPROGRAM-STATUS	Discrete	Machine state 0: Stopped 1 :Running 2: Waiting 3: Interrupted 4: Canceled 5: Others

Table 4.13: SYNTEC CNC OPC UA Driver Tag List

Mode	2:1:1:MACHINE/READ/CNC-CHANNEL?ACTOPERATIONMODE	Discrete	Operation mode 0: Manual 1: MDA 2: Auto 3: Edit 4: Home 5: MPG 6: Null 7: Others
Pcount	2:1:1:MACHINE/READ/CNC-CHANNEL?ACTPARTCOUNT	Analog	Part count
ActSpin	2:1:1:MACHINE/READ/CNC-SPINDLE?ACTSPEED	Analog	Actual spindle speed
OvSpin	2:1:1:MACHINE/READ/CNC-SPINDLE?ACTOVERRIDE	Analog	Spindle overrate
PosMacX	2:1:1:MACHINE/READ/CNC-CHANNEL/POSTCPBCS?X	Analog	X-axis machine position
PosAbsX	2:1:1:MACHINE/READ/CNC-CHANNEL/POSTCPWCS?X	Analog	X-axis absolute position
R5141	2:1:1:MACHINE/READ/CNC-DIAGNOSIS?R5141	Analog	1st spindle overload
MASTATUS	MASTATUS	Discrete	CNC connection status 0: DISCONNECT 1: RUN (only for AUTO mode) 2: IDLE 3: ALARM

Table 4.14: SYNTEC CNC OPC UA Driver Error Codes

Error Code	Description
0x8100	No data received for tag
0x8400	No data received for array tag
0x8500	Incorrect data access for array tag
0x8600	Received data type is incorrect

Table 4.15: FAGOR CNC Driver Tag List

Tag Name	Address	Type	Description
partact	partact	Analog	Part counter
optime	optime	Analog	Part-program execution time (in hundredths of a second).
tno	tno	Analog	Number of the active tool
spdlact	spdlact	Analog	Real spindle speed
feedact	feedact	Analog	Real feedrate on the tool path
spdlovrd	spdlovrd	Analog	Active spindle speed override
feedovrd	feedovrd	Analog	Active feedrate (feed override) percentage
almcount	almcount	Analog	Number of errors at the CNC
ncptr	ncptr	Analog	Number of the line of the program
dno	dno	Analog	Number of the active tool offset
gP114	globalP114	Analog	Value of the global arithmetic parameter [114] (R/W)

Table 4.15: FAGOR CNC Driver Tag List			
cP10014	commonP10014	Analog	Value of the common arithmetic parameter [10014] (R/W)
GX1	GX1	Analog	X axis (G159=1). Value of the active zero offset (absolute G159 + incremental G158)
GY1	GY1	Analog	Y axis (G159=1). Value of the active zero offset (absolute G159 + incremental G158)
GZ1	GZ1	Analog	Z axis (G159=1). Value of the active zero offset (absolute G159 + incremental G158)
CommandX	CommandX	Analog	Programmed X axis position
CommandY	CommandY	Analog	Programmed Y axis position
CommandZ	CommandZ	Analog	Programmed Z axis position
ActualX	ActualX	Analog	Real X axis position
ActualY	ActualY	Analog	Real Y axis position
ActualZ	ActualZ	Analog	Real Z axis position
ToGoX	ToGoX	Analog	Distance left (to go) for the X axis to reach the programmed coordinate
ToGoY	ToGoY	Analog	Distance left (to go) for the Y axis to reach the programmed coordinate
ToGoZ	ToGoZ	Analog	Distance left (to go) for the Z axis to reach the programmed coordinate
status	cncstatu	Discrete	CNC status. 0: Not ready 1: Ready 2: In execution 3: Interrupted 4: In error
mode	cncmode	Discrete	Mode that the interface is in 0: Automatic 1: Manual 2: MDI/MDA
programe	programe	Text	Name of the program selected in automatic
date	cncdate	Text	Date in year-month-day format
time	cnctime	Text	Time in hours-minutes-seconds format
version	cncversion	Text	CNC version and release number
model	cncmodel	Text	CNC model
Mcode	Mcode	Text	"M" functions of the master spindle to be displayed in the history
Gcode	Gcode	Text	"G" functions to be displayed in the history.
MASTATUS	MASTATUS	Discrete	CNC connection status 0: DISCONNECT 1: RUN (only for AUTO mode) 2: IDLE 3: ALARM

Table 4.16: FAGOR CNC Driver Error Codes	
Error Code	Description
0x8001	No data received
0x8002	Address setting error

Table 4.17: Roders RMS6-ERP Driver Tag List

Tag Name	Address	Type	Description
version	version	Analog	XML version of output format
time	time	Text	Timestamp
name	name	Text	Machine name
location	location	Text	Machine location
cluster	cluster	Text	Machine cluster
ver	ver	Text	Version of RMS6 control software
mode	mode	Discrete	Mode 0: MANUAL 1: AUTOMATIC
state	state	Discrete	State of machine 0: IDLE 1: OFF 2: ECO 3: RUNNING 4: ERROR
door	doorstate	Discrete	State of operator machine door 0: CLOSED 1: OPEN
autodoor	autodoorstate	Discrete	State of automatic door 0: CLOSED 1: OPEN
tooldoor	tooldoorstate	Discrete	State of toolchanger door 0: CLOSED 1: OPEN
feed	feed	Analog	Feed (mm/min)
ovfeed	ov_feed	Analog	Override feed (in percent)
tool	tool	Analog	Location number of actual tool
tooltype	tooltype	Text	Spindle tool type
spinsped	spinspeed	Analog	Spindle speed (rpm) of current spindle
ovspin	ov_spinspeed	Analog	Override spindle speed (in percent, current spindle)
cname	cname	Text	Current job
ncpgm	ncpgm	Text	Path of chosen NC file
startjob	start	Text	Time of job start
lastjob	lastjobend	Text	Time of completing last job
subpgm	subpgm	Text	Path of the actual subprogram
substart	substart	Text	Time of beginning subprogram
percent	percent	Analog	Progress (in percent)
line	line	Analog	Current program line
chuck	chuck	Analog	Current chuck
pallet	pallet	Analog	Current pallet
bdestart	bde_start	Text	Start of operating data collecting
optime	op_duration	Analog	Operating time (seconds)
oputi	op_percent	Text	Operating utilization in percent
ncime	nc_duration	Analog	Milling time (seconds)
ncuti	nc_percent	Text	Milling utilization in percent
settime	set_duration	Analog	Setup time (seconds)

Table 4.17: Roders RMS6-ERP Driver Tag List			
setuti	set_percent	Text	Setup time utilization in percent
spinsta	spin_start	Text	Start of spindle data collecting of first spindle
spintime	spin_duration	Analog	Spindle on time of first spindle (seconds)
spin2sta	spin2_start	Text	Start of spindle data collecting of second spindle
MASTATUS	MASTATUS	Discrete	CNC connection status 0: DISCONNECT 1: RUN (only for AUTO mode) 2: IDLE 3: ALARM

Table 4.18: Roders RMS6-ERP Driver Error Codes	
Error Code	Description
0x8001	XML file storage path error
0x8002	Error creating parse XML file storage path
0x8003	Error moving XML file to parse XML path
0x8004	XML file parsing failed
0x8005	XML file content is empty
0x8006	XML root node is not ERP
0x8007	No data at this measuring point

Table 4.19: OKUMA Mill CNC Driver Tag List

Tag Name	Address	Type	Description
axesNo	Get.0.1001.0.0.8	Analog	Get the number of the NC-controlled axes
BlkNo	Get.14.3905.0.0.8	Analog	Get the currently executed block No
ComVar	Get.0.4001.0.0.14/SubscriptArray	Analog (Array)	Get the common variable by array size
count	Get.0.3066.0.0.8/SubscriptArray	Analog (Array)	Get the number of machined workpieces
countS	Get.0.3067.0.0.8/SubscriptArray	Analog (Array)	Set the number of machined workpieces
CRCNo	Get.0.2013.0.0.8	Analog	Get the selected cutter radius compensation number
FCmd	Get.0.5139.0.0.0	Analog	Get the f command value
FeedRMin	Get.0.3018.0.0.2	Analog	Get the actual feed rate (mm/min)
FeedRRev	Get.0.3019.0.0.2	Analog	Get the actual feed rate (mm/rev)
FeedS1Ld	Get.0.2174.0.0.8	Analog	Get the NC feed shaft loading (%) (starting by address 2174.0)
OvFeed	Get.0.2018.0.0.8	Analog	Get the state of feed rate override SW (%)
OvRapid	Get.0.2017.0.0.8	Analog	Get the state of rapid override SW (%)
OvSpin	Get.0.2016.0.0.8	Analog	Get the state of spindle override SW (%)
PosAbs1	Get.0.3004.0.0.2	Analog	Get the current position (starting by address 3004.0)
PosDis1	Get.0.3011.0.0.2	Analog	Get the remainder distance (starting by address 3011.0)
PosMac1	Get.0.3005.0.0.2	Analog	Get the machine position (starting by address 3005.0)
PosRel1	Get.0.3007.0.0.2	Analog	Get the relative position (starting by address 3007.0)
PosTar1	Get.0.3012.0.0.2	Analog	Get the target position (starting by address 3012.0)
Spinload	Get.0.2014.0.0.8	Analog	Get the spindle load (%)
SpinReA	Get.0.2007.0.0.8	Analog	Get the actual spindle revolutions per minute (rpm)
SpinReC	Get.0.2006.0.0.8	Analog	Get the command spindle revolution per minute (rpm)
TLNo	Get.0.2034.0.0.9	Analog	Get the current tool No.
TLNoNext	Get.0.2035.0.0.9	Analog	Get the next tool No.
TLOffNo	Get.0.2012.0.0.8	Analog	Get the selected tool length offset number
WCNo	Get.0.2061.0.0.8	Analog	Get the selected work coordinate system number
dryrun	Get.0.1078.0.0.8	Discrete	Get the Dry run status value
FCKind	Get.0.1367.0.0.8	Discrete	Get the f command kind
MLock	Get.0.1079.0.0.8	Discrete	Get the machine block status value.
Mtype	Get.14.1008.0.0.8	Discrete	Machine type
NCalarm	Get.14.1.0.0.8	Discrete	Get the NC status (alarm)

Table 4.19: OKUMA Mill CNC Driver Tag List

NChold	Get.14.1.0.2.8	Discrete	Get the NC status (hold)
NClimit	Get.14.1.0.1.8	Discrete	Get the NC status (limit)
NCPstop	Get.14.1.0.5.8	Discrete	Get the NC status (program stop)
NCRun	Get.14.1.0.4.8	Discrete	Get the NC status (running)
NCSTM	Get.14.1.0.3.8	Discrete	Get the NC status (STM)
NCTurr	Get.14.1.0.6.8	Discrete	Get the NC status (turret selection)
Opmode	Get.14.1001.0.0.8	Discrete	Operation mode
ProgStat	Get.14.1004.0.0.8	Discrete	Running(1) or Not running(0) as the program status
SingBlk	Get.0.1080.0.0.8	Discrete	Get the single block state
SpinStat	Get.0.1966.0.0.8	Discrete	Get spindle rotation status
AlmHisNo	Get.0.5941.0.0.0/SubscriptArray	Text (Array)	Alarm history information (0~19)
AlmMes	Get.14.5003.0.0.0	Text	Get the alarm message
Ax1name	Get.0.5001.0.0.0	Text	Get the axis name (starting by address 5001.0)
Execname	Get.0.5035.0.0.0	Text	Get O number after the program has been selected
Gcode	GetByText.0.6013	Text (Array)	Get the effective G code
Mcode	GetByText.0.6017	Text (Array)	Get the effective M code
MID	Get.14.5916.0.0.0	Text	Get the machine ID
ProgBlk	GetByText.0.6011	Text (Array)	Get the execute program display. Column number: 35
Programe	Get.14.5010.0.0.0	Text	Get the selected main program file name
Schename	Get.14.5011.0.0.0	Text	Get the schedule program name
SeqNo	Get.14.5014.0.0.0	Text	Get the currently executed sequence No
TCut	Get.0.3062.0.0.13	Text	Get the cutting time (sec)
TCutS	Get.0.3063.0.0.13	Text	Set the cutting time (sec)
TExtIn	Get.0.3064.0.0.13	Text	Get the external input time (sec)
TExtInS	Get.0.3065.0.0.13	Text	Set the external input time (sec)
TNCRun	Get.0.3058.0.0.13	Text	Get the NC running time (sec)
TNCRunS	Get.0.3059.0.0.13	Text	Set the NC running time (sec)
TPowOn	Get.0.3056.0.0.13	Text	Get the power on time (sec)
TPowOnS	Get.0.3057.0.0.13	Text	Set the power on time (sec)
TSpinRe	Get.0.3060.0.0.13	Text	Get the spindle revolution time (sec)
TSpinReS	Get.0.3061.0.0.13	Text	Set the spindle revolution time (sec)
MASTATUS	MASTATUS	Discrete	CNC connection status 0: DISCONNECT 1: RUN 2: IDLE 3: ALARM

Table 4.20: OKUMA Lathe CNC Driver Tag List

Tag Name	Address	Type	Description
axisSped	Get.0.3115.0.0.2	Analog	Get the axis travel speed in the currently specified unit
BaxisLd	Get.0.2170.0.0.8	Analog	Get the current B-axis load value (%).
ComVar	Get.0.4001.0.0.14/SubscriptArray	Analog (Array)	Get the common variable by array size.
count	Get.0.3156.0.0.8/SubscriptArray	Analog (Array)	Get the number of machined workpieces
countS	Get.0.3157.0.0.8/SubscriptArray	Analog (Array)	Set the number of machined workpieces
edgeNo	Get.0.1598.0.0.8	Analog	Get the indexed edge no. to the current machining position
FeedS1Ld	Get.0.2037.0.0.8	Analog	Get the NC feed shaft loading (%) (starting by address 2037.0)
MaxisLd	Get.0.2039.0.0.8	Analog	Get the turret of M-axis load value (%).
MaxiSped	Get.0.2041.0.10.8	Analog	Get the M-axis speed (RPM).
noseRNo	Get.0.2145.0.0.8	Analog	Get the selected nose R no.
OffNo	Get.0.2144.0.0.8	Analog	Get the selected offset no.
Opmode	Get.0.1004.0.0.8	Analog	Operation mode: AUTO(-128),MDI(64),MANUAL(32)
PosAbs1	Get.0.3002.0.0.2	Analog	Get the current position (starting by address 3002.0)
PosDis1	Get.0.3008.0.0.2	Analog	Get the remainder distance (starting by address 3008.0)
PosMac1	Get.0.3037.0.0.2	Analog	Get the machine position (starting by address 3037.0)
PosNo	Get.0.2145.0.0.8	Analog	Get the indexed position no. to the current machining position
PosTar1	Get.0.3009.0.0.2	Analog	Get the target position (starting by address 3009.0)
Spin1Ld	Get.0.2038.0.0.8	Analog	Get the spindle load value (%)
Spin2Ld	Get.0.2040.0.0.8	Analog	Get the second spindles load value (%)
SpinSped	Get.0.2006.0.0.8	Analog	Get the spindle speed (RPM)
SurfSped	Get.0.3053.0.0.2	Analog	Get the surface speed.
TLNo	Get.0.2095.0.0.9	Analog	Get the indexed tool no. to the current machining position
TurrNo	Get.0.2421.0.0.8	Analog	Get the indexed turret no. to the current machining position
Mtype	Get.14.1008.0.0.8	Discrete	Machine type
NCalarm	Get.0.19.0.0.8	Discrete	Get the NC status (alarm)
NChold	Get.0.19.0.2.8	Discrete	Get the NC status (hold).
NClimit	Get.0.19.0.1.8	Discrete	Get the NC status (limit).
NCPstop	Get.0.19.0.5.8	Discrete	Get the NC status (program stop).
NCRun	Get.0.19.0.4.8	Discrete	Get the NC status (running).
NCSTM	Get.0.19.0.3.8	Discrete	Get the NC status (STM).
NCTurr	Get.0.19.0.6.8	Discrete	Get the NC status (turret selection).

Table 4.20: OKUMA Lathe CNC Driver Tag List

ProgStat	Get.0.1901.0.0.8	Discrete	Running(1) or Not running(0) as the program status
SpinSele	Get.0.1207.0.0.0	Discrete	Get the currently selected spindle.
SysSele	Get.14.1904.0.0.8	Discrete	Get the system selected on the panel
Turret	Get.14.1006.0.0.8	Discrete	Get the currently selected turret.
AlmMes	Get.0.5009.0.0.0	Text	Get the alarm message
Ax1name	Get.0.5020.0.0.0	Text	Get the axis name (starting by address 5020.0)
Feedtype	Get.0.5022.0.0.0	Text	Get the feed rate type.
IGFname	Get.0.5146.0.0.0	Text	Get the IGF-Data file name.
MID	Get.14.5916.0.0.0	Text	Get the machine ID.
Programe	Get.0.5004.0.0.0	Text	Get the main program file name currently selected.
ProgNo	Get.0.5001.0.0.0	Text	Get the program no. (name) currently executed.
Schedule	Get.0.5006.0.0.0	Text	Get the schedule program name
SeqNo	Get.0.5002.0.0.0	Text	Get the currently executed sequence No
TCut	Get.0.3164.0.0.13	Text	Get the cutting time (sec).
TCutS	Get.0.3165.0.0.13	Text	Set the cutting time (sec).
TExtIn	Get.0.3166.0.0.13	Text	Get the external input time (sec).
TExtInS	Get.0.3167.0.0.13	Text	Set the external input time (sec).
TNCRun	Get.0.3160.0.0.13	Text	Get the NC running time (sec).
TNCRunS	Get.0.3161.0.0.13	Text	Set the NC running time (sec).
TPowOn	Get.0.3158.0.0.13	Text	Get the power on time (sec).
TPowOnS	Get.0.3159.0.0.13	Text	Set the power on time (sec).
TSpinRe	Get.0.3162.0.0.13	Text	Get the spindle revolution time (sec).
TSpinReS	Get.0.3163.0.0.13	Text	Set the spindle revolution time (sec).
MASTATUS	MASTATUS	Discrete	CNC connection status 0: DISCONNECT 1: RUN 2: IDLE 3: ALARM

Table 4.21: OKUMA CNC Driver Error Codes

Error Code	Description
0x8001	Incorrect tag address
0x8002	Connection fail
0x8003	Communication fail
0x8004	API fail
0x8005	The number of API is not correct

Table 4.22: SIEMENS CNC Driver Tag List (S840D)			
Tag Name	Address	Type	Description
feedov	feedov	Analog	Feedrate override
rapidov	rapidov	Analog	Rapid traverse override
spinspd	DBD21,100	Analog	Spindle speed
spinov	DBB34,19	Analog	Spindle override (DBB3x depends on axis sequence)
CHACTIVE	CHACTIVE	Discrete	Channel status active
CHINT	CHINT	Discrete	Channel status interrupted
CHRESET	CHRESET	Discrete	Channel status reset
DRIRDY	DRIRDY	Discrete	Driver is ready
emergen	emergen	Discrete	Status of emergency
AUTO	AUTO	Discrete	Automatic mode
JOG	JOG	Discrete	JOG mode
MDI	MDI	Discrete	MDI mode
NCALM	NCALM	Discrete	NC alarm is present
NCRDY	NCRDY	Discrete	NC is ready
PGABORT	PGABORT	Discrete	Program status aborted
PGINT	PGINT	Discrete	Program status interrupted
PGRUN	PGRUN	Discrete	Program status running
PGSTOP	PGSTOP	Discrete	Program status stopped
PGWAIT	PGWAIT	Discrete	Program status wait
REF	REF	Discrete	Active REF machine function
REPOS	REPOS	Discrete	Active REPOS machine function
TEACHIN	TEACHIN	Discrete	Active TEACH IN machine function
ALM_TMP	DBX10,109	Discrete	Temperature alarm
ALM_HS	DBX10,109	Discrete	Heat sink alarm
ALM_BAT	DBX10,109	Discrete	Battery alarm
M00M01	DBX21,32	Discrete	M00/M01 active
M02M30	DBX21,33	Discrete	M02/M30 active
MASTATUS	MASTATUS	Discrete	CNC connection status 0: DISCONNECT 1: RUN (only for AUTO mode) 2: IDLE 3: ALARM

Table 4.23: SIEMENS CNC Driver Tag List (S828D)			
Tag Name	Address	Type	Description
feedov	feedov	Analog	Feedrate override
rapidov	rapidov	Analog	Rapid traverse override
spinspd	DBD2500,4000	Analog	Spindle speed
spinov	DBB3804,2003	Analog	Spindle override (DBB380x depends on axis sequence)
CHACTIVE	CHACTIVE	Discrete	Channel status active
CHINT	CHINT	Discrete	Channel status interrupted
CHRESET	CHRESET	Discrete	Channel status reset
DRIRDY	DRIRDY	Discrete	Driver is ready
emergen	emergen	Discrete	Status of emergency
AUTO	AUTO	Discrete	Automatic mode
JOG	JOG	Discrete	JOG mode
MDI	MDI	Discrete	MDI mode
NCALM	NCALM	Discrete	NC alarm is present
NCRDY	NCRDY	Discrete	NC is ready
PGABORT	PGABORT	Discrete	Program status aborted
PGINT	PGINT	Discrete	Program status interrupted
PGRUN	PGRUN	Discrete	Program status running
PGSTOP	PGSTOP	Discrete	Program status stopped
PGWAIT	PGWAIT	Discrete	Program status wait
REF	REF	Discrete	Active REF machine function
TEACHIN	TEACHIN	Discrete	Active TEACH IN machine function
ALM_TMP	DBX2700,3	Discrete	Temperature alarm
M00M01	DBX3300,0	Discrete	M00/M01 active
M02M30	DBX3300,1	Discrete	M02/M30 active
REQ_ABS	DBX2600,1	Discrete	Request the absolute position of axes (R/W)
REQ_DIS	DBX2600,1	Discrete	Request the distances to go information of axes (R/W)
MASTATUS	MASTATUS	Discrete	CNC connection status 0: DISCONNECT 1: RUN (only for AUTO mode) 2: IDLE 3: ALARM

Table 4.24: SIEMENS Driver Error Codes	
Error Code	Description
0x8020	Error when converting Gray code or Binary code
0x8100	Open port failed
0x8102	Data size error
0x8XYX	X: Error class, YY: Error code
0xB000	Message sequence error
0xB1XX	Error Code (byte 15)
0xB2XX	Message error (byte 16)
0xB300	Data size error

Table 4.25: MITSUBISHI CNC Driver Tag List			
Tag Name	Address	Type	Description
posabs1	posabs_1	Analog	Read axis 1 absolute position information _1: axis number 1
posmac1	posmac_1.0	Analog	Read axis 1 machine position information _1.0: axis number 1, normal _1.1: axis number 1, Skip is on
pos1rel1	posrel_1.0	Analog	Read axis 1 relative position information _1.0: axis number 1, normal _1.1: axis number 1, Skip is on
posdis1	posdis_1.0	Analog	Read axis 1 distance to go information _1.0: axis number 1, normal _1.1: axis number 1, Skip is on
posned1	posned_1	Analog	Read axis 1 next distance information _1: axis number 1
ncstatus	ncstatus	Discrete	Status of automatic operation 0: RESET 1: STOP 2: HOLD 3: START
isalarm	isalarm	Discrete	Status of alarm
ncalarm	ncalarm	Text (Array)	NC alarm array(10)
stopcode	stopcode	Text (Array)	Stop code array(10)
plcalarm	plcalarm	Text (Array)	PLC alarm message array(10)
opemsg	opemsg	Text (Array)	Operator message array(10)
allalarm	allalarm	Text (Array)	No alarm type distinction array(10)
emergen	emergen	Discrete	Status of emergency
mode	mode	Analog	Mode selection (mode.extvt0) 0: Jog 1: Handle 2: Incremental 3: Manual arbitrary feed 4: Reference position return 5: Automatic initial set mode 6: Jog-handle simultaneous 8: Memory 9: Tape 11: MDI 14: Sub part system control I mode ON
axescur	axescur	Analog	Current controlled axes
sysno1	sysno_1	Text	System software number _1: axis number 1
sysname1	sysname_1	Text	System name _1: axis number 1
version1	version_1	Text	PLC version _1: axis number 1
serialno	serialno	Text	NC serial number
setfeed	setfeed	Analog	Read feed rate command

Table 4.25: MITSUBISHI CNC Driver Tag List

actfeed	actfeed	Analog	Read actual feed rate
ovfeed	ovfeed	Analog	Read feed rate override
ovrapid	ovrapid	Analog	Read rapid override
actspin1	actspin_1	Analog	Read actual spindle speed _1: spindle number 1
ovspin	ovspin	Analog	Read spindle override
sp1load	spload_1	Analog	Read spindle 1 load (%) _1: spindle number 1
ax1load	axload_1	Analog	Read axis 1 load (%) _1: axis number 1
pcount	pcount	Analog	Read part count
prequire	prequire	Analog	Read required part count
mainprog	mainprog	Text	Read main program number
subprog	subprog	Text	Read sub program number
mainseq	mainseq	Analog	Read main program sequence
subseq	subseq	Analog	Read sub program sequence
powhour	powhour	Analog	Read power time (hours)
powmin	powmin	Analog	Read power time (minutes)
powsec	powsec	Analog	Read power time (seconds)
runhour	runhour	Analog	Read run time (hours)
runmin	runmin	Analog	Read run time (minutes)
runsec	runsec	Analog	Read run time (seconds)
starhour	starhour	Analog	Read start time (hours)
starmin	startmin	Analog	Read start time (minutes)
starsec	startsec	Analog	Read start time (seconds)
sysyear	sysyear	Analog	Read system time (year)
sysmonth	sysmonth	Analog	Read system time (month)
sysdate	sysdate	Analog	Read system time (date)
syshour	syshour	Analog	Read system time (hours)
sysmin	sysmin	Analog	Read system time (minutes)
syssec	syssec	Analog	Read system time (seconds)
gcode	gcode	Analog (Array)	G code array(21)
mcode1	mcode_1	Analog	M code1 (1 to 4) _1: command number 1
tcode1	tcode_1	Analog	T code1 (1 to 4) _1: command number 1
bcode1	bcode_1	Analog	B code1 (1 to 4) _1: command number 1
d1code1	dcode1_1	Analog	D1 code1 (shape compensation number) _1: axis number 1
d2code1	dcode2_1	Analog	D2 code1 (wear compensation number) _1: axis number 1
hcode1	hcode_1	Analog	H code1 (length compensation number) _1: axis number 1
mac500	mac_500	Analog	Read/write macro 500 value _500: macro number 500

Table 4.25: MITSUBISHI CNC Driver Tag List			
TLType	tolifetype	Discrete	Get tool life type 0: Disabled 1: Type 1 2: Type 2
TLTitle	tolifeti	Text Array	Get the array(11) title of tool life
TLg1t1	tolifevalue_1_1	Text Array	Get the array(11) values of tool life by tool group number 1 and tool number 1 _1: tool group number 1 _1: tool number 1
getodata	getodata	Discrete	Flag (0 ->1) from getting all tool offset data including offtitle, offset_0, offset_1, ..., offset_8
offtitle	offtitle	Text Array	Reads tool offset's title array(9)
offset_0	offset_0	Analog Array	R/W tool offset value (Column 0)
offset_1	offset_1	Analog Array	R/W tool offset value (Column 1)
offset_2	offset_2	Analog Array	R/W tool offset value (Column 2)
offset_3	offset_3	Analog Array	R/W tool offset value (Column 3)
offset_4	offset_4	Analog Array	R/W tool offset value (Column 4)
offset_5	offset_5	Analog Array	R/W tool offset value (Column 5)
offset_6	offset_6	Analog Array	R/W tool offset value (Column 6)
offset_7	offset_7	Analog Array	R/W tool offset value (Column 7)
offset_8	offset_8	Analog Array	R/W tool offset value (Column 8)
wcg54_1	wc_g54_1	Analog	R/W G54 work coordinates data _1: G54 number 1
wcg55_1	wc_g55_1	Analog	R/W G55 work coordinates data _1: G55 number 1
wcg56_1	wc_g56_1	Analog	R/W G56 work coordinates data _1: G56 number 1
wcg57_1	wc_g57_1	Analog	R/W G57 work coordinates data _1: G57 number 1
wcg58_1	wc_g58_1	Analog	R/W G58 work coordinates data _1: G58 number 1
wcg59_1	wc_g59_1	Analog	R/W G59 work coordinates data _1: G59 number 1
wcext_1	wc_ext_1	Analog	R/W EXT work coordinates data _1: EXT number 1
B_0	B_0	Analog	Fixed counter B_0 to B_1FFF (1 bit, 8192 points)
C_0	C_0	Analog	Counter coil C_0 to C_1255 (1 bit, 1256 points)
D_0	D_0	Analog	Data register D_0 to D_4095 (16 bit, 2048 points)
E_0	E_0	Analog	Special relay E_0 to E_127 (1bit, 248 points)

Table 4.25: MITSUBISHI CNC Driver Tag List

F_0	F_0	Analog	Alarm message interface, temporary memory. F_0 to F_1024 (1 bit, 1024 points)
G_0	G_0	Analog	Temporary memory G_0 to G_3071 (1bit, 3072 points)
I_0	I_0	Analog	I device I_0 to I_3FF (1 bit, 1024 points)
J_0	J_0	Analog	J device J_0 to J_63F (1 bit, 1600 points)
L_0	L_0	Analog	Latch relay L_0 to L_511 (1 bit, 512 points)
M_0	M_0	Analog	Temporary memory M_0 to M10239 (1 bit, 10240 points)
Q_0	Q_0	Analog	Q device Q_0 to Q_1151 (1 bit, 1152 points)
R_0	R_0	Analog	File register, CNC word interface R_0 to R_32767 (16 bit, 32768 points)
SM_0	SM_0	Analog	Special relay SM_0 to SM_127 (1bit, 128 points)
SB_0	SB_0	Analog	Special relay SB_0 to SB_1FF (1 bit, 512 points)
SD_0	SD_0	Analog	Special register SD_0 to SD_127 (16 bit, 128 points)
ST_0	ST_0	Analog	Cumulative timer ST_0 to ST_1063 (1 bit, 1064 points)
SW_0	SW_0	Analog	Special register SW_0 to SW_FDF (16 bit, 4096 points)
T_0	T_0	Analog	10ms unit timer coil T_0 to T_1703 (1 bit, 1704 points)
U_0	U_0	Analog	For two input signal lines to programmable controller U_0 to U_17F (1 bit, 384 points)
V_0	V_0	Analog	V device V_0 to V_255 (1 bit, 256 points)
W_0	W_0	Analog	For two output signal lines to programmable controller W_0 to W_1FFF (1 bit, 512 points)
X_0	X_0	Analog	Input signal to PLC X_0 to X_1FFF (1 bit, 8192 points)
Y_0	Y_0	Analog	Output signal from PLC Y_0 to Y_1FFF (1 bit, 8192 points)
ZR_0	ZR_0	Analog	File register ZR_0 to ZR_32767 (16 bit, 32768 points)
MASTATUS	MASTATUS	Discrete	CNC connection status 0: DISCONNECT 1: RUN (only for MEM mode) 2: IDLE 3: ALARM

Note!

1. *Mitsubishi driver supports two scan time settings. The first scan timer interval is the same as other drivers which is set in the TCPIP port setting. The second scan timer (ScanTimeMs2) is designed in "ms". Users can add "/2" at the end of the tag address to use the second timer (ScanTimeMs2) as the address setting "powsec/2".*
2. *All the Mitsubishi CNC devices must be set in the same WebAccess TCPIP port and share the Scan Time and ScanTimeMS setting.*
3. *Please install the runtime library "FCSB1224W100-A5.exe" downloaded from Mitsubishi's website before using WebAccess/CNC driver to connect to Mitsubishi CNC.*

Table 4.26: MITSUBISHI Driver Error Codes

Error Code	Description
0x8001	Incorrect tag address
0x8002	Initial API fail
0x8003	Device connecting
0x8004	Connection fail
0x8005	Command fail
0x8006	Incorrect array size
0x8007	Message error (getodata is not executed)
0x8B00	Point value is not initialized
0x8C00	Driver (.exe) is not executed

Table 4.27: KUKA Robot OPC UA Driver Tag List

Tag Name	Address	Type	Description
IPAddr	IPAddr	Text	Controller IP address
MacAddr	MacAddr	Text	Controller MAC address
SubMask	SubMask	Text	Controller subnet mask
Gateway	Gateway	Text	Controller gateway
CUpTime	CUpTime	Text	Controller up time
ProjName	ProjName	Text	Current project name
ProjVer	ProjVer	Text	Current project version
StUpTime	StUpTime	Text	Startup time
UpsState	UpsState	Text	UPS state
ExecLine	ExecLine	Analog	Execution command pointer line
ExecModu	ExecModu	Text	Execution command pointer module
ExecMode	ExecMode	Discrete	Execution mode: 0: Cycle 1: Continuous 2: Step
ProgStat	ProgStat	Text	Program state
ProgLoad	ProgLoad	Discrete	Task program loaded status: 0: False 1: True
ProgName	ProgName	Text	Task program name
A1Pos	A1Pos	Analog	Axis 1 actual position
A1Spd	A1Spd	Analog	Axis 1 actual speed
A1SpdRel	A1SpdRel	Analog	Axis 1 relative speed
A1TRDen	A1TRDen	Analog	Axis 1 transmission ratio denominator
A1TRNum	A1TRNum	Analog	Axis 1 transmission ratio numerator
A1ID	A1AssetID	Text	Axis 1 asset ID
A1MProf	A1MProf	Discrete	Axis 1 motion profile 0: Other 1: Rotary 2: Rotary Endless 3: Linear 4: Linear Endless
A2Pos	A2Pos	Analog	Axis 2 actual position
A2Spd	A2Spd	Analog	Axis 2 actual speed
A2SpdRel	A2SpdRel	Analog	Axis 2 relative speed
A2TRDen	A2TRDen	Analog	Axis 2 transmission ratio denominator
A2TRNum	A2TRNum	Analog	Axis 2 transmission ratio numerator
A2ID	A2AssetID	Text	Axis 2 asset ID
A2MProf	A2MProf	Discrete	Axis 2 motion profile 0: Other 1: Rotary 2: Rotary Endless 3: Linear 4: Linear Endless
A3Pos	A3Pos	Analog	Axis 3 actual position
A3Spd	A3Spd	Analog	Axis 3 actual speed
A3SpdRel	A3SpdRel	Analog	Axis 3 relative speed
A3TRDen	A3TRDen	Analog	Axis 3 transmission ratio denominator

Table 4.27: KUKA Robot OPC UA Driver Tag List			
A3TRNum	A3TRNum	Analog	Axis 3 transmission ratio numerator
A3ID	A3AssetID	Text	Axis 3 asset ID
A3MProf	A3MProf	Discrete	Axis 3 motion profile 0: Other 1: Rotary 2: Rotary Endless 3: Linear 4: Linear Endless
A4Pos	A4Pos	Analog	Axis 4 actual position
A4Spd	A4Spd	Analog	Axis 4 actual speed
A4SpdRel	A4SpdRel	Analog	Axis 4 relative speed
A4TRDen	A4TRDen	Analog	Axis 4 transmission ratio denominator
A4TRNum	A4TRNum	Analog	Axis 4 transmission ratio numerator
A4ID	A4AssetID	Text	Axis 4 asset ID
A4MProf	A4MProf	Discrete	Axis 4 motion profile 0: Other 1: Rotary 2: Rotary Endless 3: Linear 4: Linear Endless
A5Pos	A5Pos	Analog	Axis 5 actual position
A5Spd	A5Spd	Analog	Axis 5 actual speed
A5SpdRel	A5SpdRel	Analog	Axis 5 relative speed
A5TRDen	A5TRDen	Analog	Axis 5 transmission ratio denominator
A5TRNum	A5TRNum	Analog	Axis 5 transmission ratio numerator
A5ID	A5AssetID	Text	Axis 5 asset ID
A5MProf	A5MProf	Discrete	Axis 5 motion profile 0: Other 1: Rotary 2: Rotary Endless 3: Linear 4: Linear Endless
A6Pos	A6Pos	Analog	Axis 6 actual position
A6Spd	A6Spd	Analog	Axis 6 actual speed
A6SpdRel	A6SpdRel	Analog	Axis 6 relative speed
A6TRDen	A6TRDen	Analog	Axis 6 transmission ratio denominator
A6TRNum	A6TRNum	Analog	Axis 6 transmission ratio numerator
A6ID	A6AssetID	Text	Axis 6 asset ID
A6MProf	A6MProf	Discrete	Axis 6 motion profile 0: Other 1: Rotary 2: Rotary Endless 3: Linear 4: Linear Endless
FLCM_X	FLCM_X	Analog	Flange load's center of mass in Cartesian coordinates X
FLCM_Y	FLCM_Y	Analog	Flange load's center of mass in Cartesian coordinates Y
FLCM_Z	FLCM_Z	Analog	Flange load's center of mass in Cartesian coordinates Z
FLCM_A	FLCM_A	Analog	Flange load's center of mass in orientation A
FLCM_B	FLCM_B	Analog	Flange load's center of mass in orientation B

Table 4.27: KUKA Robot OPC UA Driver Tag List			
FLCM_C	FLCM_C	Analog	Flange load's center of mass in orientation C
FLIner_X	FLIner_X	Analog	Flange load's inertia X
FLIner_Y	FLIner_Y	Analog	Flange load's inertia Y
FLIner_Z	FLIner_Z	Analog	Flange load's inertia Z
FLMass	FLMass	Analog	Flange load's mass
InCont	InCont	Discrete	In control status: 0: False 1: True
InMotion	InMotion	Discrete	In motion status: 0: False 1: True
IntialOP	IntialOP	Text	Initial operation
OnPath	OnPath	Discrete	On path status: 0: False 1: True
SpeedOV	SpeedOV	Analog	Speed override
CurrAct	CurrAct	Analog (Array)	Actual current of axes
MotTemp	MotTemp	Analog (Array)	Current motor temperature of an axes
PowFail	PowFail	Discrete	Display of power failure: 0: False 1: True
EmerStop	EmerStop	Discrete	Emergency stop status: 0: False 1: True
ENDevice	ENDevice	Discrete	Enabling device status: 0: False 1: True
IntEmer	IntEmer	Discrete	Internal emergency stop status: 0: False 1: True
OPMode	OPMode	Discrete	Operation mode 0: Other (INVALID) 1: Manual reduced speed (T1) 2: Manual high speed (T2) 3: Automatic (AUT) 4: Automatic external (EX)
ProtStop	ProtStop	Discrete	Protective stop status: 0: False 1: True
OPCver	OPCver	Text	OPC UA software version
OPCTime	OPCTime	Text	OPC UA server time
OPCStart	OPCStart	Text	OPC UA server start time
OPCState	OPCState	Discrete	OPC UA server state 0: Running 1: Failed 2: No configuration 3: Suspended 4: Shutdown 5: Test 6: Communication fault 7: Unknown

Table 4.28: KUKA Robot OPC UA Driver Error Codes

Error Code	Description
0x8100	No data received for tag
0x8200	Problem with the tag's size setting
0x8300	The array size of tag is smaller than the real tag
0x8400	No data received for array tag
0x8500	Incorrect data access for array tag
0x8600	Received data type is incorrect

Table 4.29: HNC CNC Driver Tag List

Tag Name	Address	Type	Description
Actchan	Sys.ACTIVECHAN	Analog	Active channel
almno	Alarm.No	Analog (Array)	Alarm number array
ax0chan	Axis.0.CHAN	Analog	Axis 0 channel
ax0cpos	Axis.0.CMDPOS	Analog	Axis 0 command position
ax0crel	Axis.0.CMDPOSRCs	Analog	Axis 0 command relative position
ax0cvel	Axis.0.CMDVEL	Analog	Axis 0 command velocity
ax0cwcs	Axis.0.CMDPOSWCS	Analog	Axis 0 command work coordinate position
ax0dis	Axis.0.LEFTTOGO	Analog	Axis 0 distance to go
ax0index	Axis.0.CHANINDEX	Analog	Axis 0 index
ax0load	Axis.0.LOADCUR	Analog	Axis 0 loading current
ax0pos	Axis.0.ACTPOS	Analog	Axis 0 actual position
ax0rel	Axis.0.ACTPOSRCs	Analog	Axis 0 relative position
ax0type	Axis.0.TYPE	Analog	Axis 0 type
ax0vel	Axis.0.ACTVEL	Analog	Axis 0 actual velocity
ax0wcs	Axis.0.ACTPOSWCS	Analog	Axis 0 work coordinate position
B0	Reg.B.0	Analog	B0 register
bppos	Chan.0.0.BPPOS	Analog	Break point position
channum	Sys.CHANNUM	Analog	Channel number
CNCver	Sys.CNCVER	Analog	CNC version
cycle	Chan.0.0.CYCLE	Analog	Cycle state
D0	Reg.D.0	Analog	D0 register
dcdrow	Chan.0.0.DCDROW	Analog	Decode row
dcode	Chan.0.0.DOFF	Analog	D code
emergen	Chan.0.0.ISESTOP	Analog	Is stop (emergency)
evcode	Event.Code	Analog	Event code
evsource	Event.Src	Analog	Event source
F0	Reg.F.0	Analog	F0 register
feedact	Chan.0.0.ACTFEE-DRATE	Analog	Actual feedrate
feedcmd	Chan.0.0.CMDFEE-DRATE	Analog	Feedrate command
feedov	Chan.0.0.FEEDOVER-RIDE	Analog	Feedrate override

Table 4.29: HNC CNC Driver Tag List

feedprog	Chan.0.0.PROGFEE- DRATE	Analog	Program feedrate
fvar0	FloatVar.0	Analog	Float system variable 0
G0	Reg.G.0	Analog	G0 register
gcode	Chan.0.0.CMDTYPE	Analog	Current G code
hcode	Chan.0.0.HOFF	Analog	H code
hold	Chan.0.0.HOLD	Analog	Hold state
I0	Reg.I.0	Analog	I0 register
ishome	Chan.0.0.ISHOMING	Analog	Is homing
ismdi	Chan.0.0.ISMDI	Analog	Is MDI
isproend	Chan.0.0.ISPROGEND	Analog	Is program end
isprosel	Chan.0.0.ISPROGSEL	Analog	Is program selected
isrun	Chan.0.0.ISRUNNING	Analog	Is running
K0	Reg.K.0	Analog	K0 register
lgaxis	Chan.0.0.LAX	Analog	Logic axis
mcode	Chan.0.0.MCODE	Analog	M code
metric	Sys.METRICDISP	Analog	Metric display
modal	Chan.0.0.MODAL	Analog	Channel 0 modal
mode	Chan.0.0.MODE	Analog	Mode 0 = Reset 1 = Auto 2 = Jog 3 = Step 4 = MPG 5 = HOME 6 = PMC 7 = MDI/SBL
P0	Reg.P.0	Analog	P0 register
paravar1	Para.1.Value	Analog	Parameter 1 value
pcount	Chan.0.0.PARTCNTR	Analog	Part counts
ptotal	Chan.0.0.PARTSTATI	Analog	Part count total
Q0	Reg.Q.0	Analog	Q0 register
R0	Reg.R.0	Analog	R0 register
rapov	Chan.0.0.RAPIDOVER- RIDE	Analog	Rapid override
runprog	Chan.0.0.RUNPROG	Analog	Run program
runrow	Chan.0.0.RUNROW	Analog	Program running row
selprog	Chan.0.0.SELPROG	Analog	Select program
showtime	Sys.SHOWTIME	Analog	Show time
spdact	Chan.0.0.ACTSPDL	Analog	Actual Spindle speed
spdcmd	Chan.0.0.CMDSPDL	Analog	Spindle speed command
spdov	Chan.0.0.SPDLOVER- RIDE	Analog	Spindle override
sysvar0	SysVar.0	Analog	System variable 0
tcode	Chan.0.0.TCODE	Analog	T code
toffs	Chan.0.0.TOFFS	Analog	Tool offset number
toolrdy	Chan.0.0.TOOLRDY	Analog	Tool ready number
tooluse	Chan.0.0.TOOLUSE	Analog	Current tool use number
W0	Reg.W.0	Analog	W0 register

Table 4.29: HNC CNC Driver Tag List			
X0	Reg.X.0	Analog	X0 register
Y0	Reg.Y.0	Analog	Y0 register
almtext	Alarm.String	Text (Array)	Alarm text
ax0name	Axis.0.NAME	Text	Axis 0 name
chname	Chan.0.0.NAME	Text	Channel 0 Index 0 Name
DRVver	Sys.DRVVER	Text	Driver version
MAinfo	Sys.MACHINEINFO	Text	Machine information
MAnum	Sys.MACHINENUM	Text	Machine number
MAtype	Sys.MACHINETYPE	Text	Machine type
NCKver	Sys.NCKVER	Text	NCK version
NVver	Sys.NCVER	Text	NC version
paname	Chan.0.0.AXISNAME	Text	Channel 0 Index 0 program axis name
PLCver	Sys.PLCVER	Text	PLC version
spdlname	Chan.0.0.SPDLNAME	Text	Channel 0 index 0 spindle name
MASTATUS	MASTATUS	Discrete	CNC connection status 0: DISCONNECT 1: RUN (only for AUTO mode) 2: IDLE 3: ALARM

Table 4.30: HNC CNC Driver Error Codes	
Error Code	Description
0x8001	Incorrect tag address
0x8002	Connecting
0x8003	No value
0x8004	Connection fail
0x8005	Connection fail 2
0x8006	API fail

Table 4.31: SIEMENS CNC OPC UA Driver Tag List

Tag Name	Address	Type	Description
almnum	almnum	Analog	Number of pending general alarms
almdat	almdat	Text (Array)	Alarm date time
almno	almno	Analog (Array)	Alarm number
almmsg	almmsg	Text (Array)	Alarm message
clinfo	alminfo	Discrete (Array)	Acknowledgment criterion for an alarm 1 = Power On 2 = Reset 3 = Cancel 4 = Alarm is cancelled by NCK-software 5 = Alarm is cancelled by starting a program 6 = Alarm is cancelled by RESET in all channels of the bags 7 = Alarm is cancelled by RESET in all channels of the NC
cncemg	cncemg	Discrete	CNC emergency status 0 = false 1 = true
cncmode	cncmode	Discrete	Active mode 0 = JOG 1 = MDI 2 = AUTO
cncstate	cncstate	Analog	Program status (cncstate.extvt0) 1 = interrupted 2 = stopped 3 = in progress 4 = waiting 5 = aborted
cnctype	cnctype	Analog	NCK type (cnctype.extvt0) 0: 840D pl 1000: FM-NC 2000: 810D pl 3000: 802S 4000: 802D pl 5000: 840Di pl (up to and including SW 6) 6000: SOLUTIONLINE 10700: 840D sl 14000: 802D sl T/M 14000: 802D sl N/G or C/U 14500: 808D 15000: 840Di sl 16000: 828D
cncver	cncver	Analog	NCK version
sysstime	sysstime	Text	Time represented in PLC format
boottime	boottime	Analog	Time since control system boot on (in minutes)
powtime	powtime	Analog	Time since last normal boot (in minutes)
cuttime	cuttime	Analog	Tool operating time (in seconds)
cyctime	cyctime	Analog	Runtime of selected NC program (in seconds)
optime	optime	Analog	Total runtime of NC programs in Automatic mode (in seconds)

Table 4.31: SIEMENS CNC OPC UA Driver Tag List			
parts	parts	Analog	Total number of workpieces machined in current run
totalpar	totalpar	Analog	Total number of all machined workpieces
mainprog	mainprog	Text	Currently selected program
subprog	subprog	Text	Program name
setmain	setmain	Discrete	Flag (0 ->1) from setting the main program as setmainn
setmainn	setmainn	Text	Set an NC program name as the main program, EX 1: Part program/PROG1.MPF EX 2: Sub program/PROG2.MPF EX 3: Work pieces/temp/PROG3.MPF
actline	actline	Analog	Line number of the current NC instruction (starting at 1) 0: before program start -1: not available due to an error -2: not available because of DISPLOF
blockno	blockno	Text	Block number
progcode	progcode	Text	Current part program block
curncblk	curncblk	Text (Array)	Current running program block
gcode	gcode	Text (Array)	Active G-function of relevant group
tcode	tcode	Analog	Number of active tool
numtools	numtools	Analog	Number of tools in the area TO
toolno	toolno	Analog (Array)	T number
toolid	toolid	Text (Array)	Tool identifier
toolmag	toolmag	Analog (Array)	Current magazine in which the tool is located
toolplac	toolplac	Analog (Array)	Current location in which the tool is located
tooledge	tooledge	Analog (Array)	Number of cutting edges of a tool
t1ed1	tooled_1_1	Analog (Array)	Offset value parameters and cutting edge list with D numbers for a tool. The cutting edge data of tool 1 is set as tool_A_B A: 1 B: 1
t1md1	toolmd_1_1	Analog (Array)	Monitoring data for a tool edge. The edge 1's monitoring data of tool 1 is set as toolmd_A_B A: 1 B: 1
chanset	channel_no	Analog	Set Channel number (R/W)
chanmax	chanmax	Analog	Maximum number of available channels
channo	channo	Analog	Number of active channels
axesmax	axesmax	Analog	Maximum number of available machine axes
axesno	axesno	Analog	Number of active machine axes
axisname	axisname	Text (Array)	Machine axis name

Table 4.31: SIEMENS CNC OPC UA Driver Tag List

axisunit	axisunit	Discrete (Array)	Current physical unit of the axis position 0 = mm 1 = inch 2 = degree 3 = indexing position 4 = userdef
posabs	posabs	Analog (Array)	Programmed position
posdis	posdis	Analog (Array)	Tool base distance-to-go
posmac	posmac	Analog (Array)	Tool base position
G500	G500	Analog (Array)	G500 work offset
G54	G54	Analog (Array)	G54 work offset
G55	G55	Analog (Array)	G55 work offset
G56	G56	Analog (Array)	G56 work offset
G57	G57	Analog (Array)	G57 work offset
feedcmd	feedcmd	Analog	Desired value of axis-specific feedrate for a positioning axis
feedov	feedov	Analog	Feedrate override
feedrate	feedrate	Analog	Actual value of axis-specific feedrate
spinno	spinno	Analog	Number of spindles
spincmd1	spincmd1	Analog	Spindle1 speed desired value
spincmd2	spincmd2	Analog	Spindle2 speed desired value
spinld1	spinld1	Analog	Spindle1 driver load
spinld2	spinld2	Analog	Spindle2 driver load
spinov1	spinov1	Analog	Spindle1 override
spinov2	spinov2	Analog	Spindle2 override
spinspd1	spinspd1	Analog	Spindle1 speed
spinspd2	spinspd2	Analog	Spindle2 speed
spd1turn	spinturn1	Discrete	State of spindle1 rotation value range to be read via BTSS variable 0 = clockwise 1 = counter-clockwise 2 = stop value range to be read via \$ variable 3 = clockwise 4 = counter-clockwise 5 = stop
spd2turn	spinturn2	Discrete	State of spindle2 rotation value range to be read via BTSS variable 0 = clockwise 1 = counter-clockwise 2 = stop value range to be read via \$ variable 3 = clockwise 4 = counter-clockwise 5 = stop

Table 4.31: SIEMENS CNC OPC UA Driver Tag List			
plc_DB	Plc_DB10_D-BX56.1	Analog	PLC DB address sample as Plc_A_B A: DB10 B: DBX56.1
R_0	R_0	Analog	R variable as R_0, R_1,...
R_1_2	R_1_2	Analog (Array)	R variables in array as R_1_5: R1~R5 R_10_2: R10~R11
getmpgm	getmpgm	Discrete	Flag (0->1) from getting a NC program as mqnc from CNC memory
mqnc	mqnc	Text	NC program name with the path EX. 1: Part programs/PROG1.MPF EX. 2: Sub programs/PROG2.MPF EX. 3: Work pieces/temp/PROG3.MPF
upmpgm	upmpgm	Discrete	Flag (0->1) from uploading a NC program as upmncs to CNC memory as upmncd
upmncs	upmncs	Text	The file name or the name with the source path. EX. 1: ABC.MPF EX. 2: C:\ncfiles\123.MPF
upmncd	upmncd	Text	The file name with the destination path EX. 1: Part programs/PROG1.MPF EX. 2: Sub programs/PROG2.MPF EX. 3: Work pieces/temp/PROG3.MPF
MASTATUS	MASTATUS	Discrete	CNC connection status 0: DISCONNECT 1: RUN (only for AUTO mode) 2: IDLE 3: ALARM

Table 4.32: SIEMENS CNC OPC UA Driver Error Codes	
Error Code	Description
0x8001	Incorrect tag type
0x8002	Incorrect tag address
0x8003	No value
0x8004	Connection fail
0x8005	Number of tags exceeds the upper limit of each device

Table 4.33: KND CNC Driver Tag List

Tag Name	Address	Type	Description
id	0:id	Text	System ID
type	0:type	Text	System type
cnctype	0:cnc-type	Text	CNC type
cncname	0:cnc-name	Text	CNC name
softver	0:soft-version	Text	Software version
axisname	0:nc-axes	Text (Array)	Read axis name
nolinear	1:linear-axis-count	Analog	Number of linear axes
norotary	1:rotary-axis-count	Analog	Number of rotary axes
nospin	1:spindle-count	Analog	Number of spindles
nopath	1:path-count	Analog	Number of paths
status	2:run-status	Discrete	CNC status
opmode	2:opr-mode	Analog	Operation mode (opmode.extvt0) 0: MDI 1: MEM 3: EDIT 4: JOG 5: Handle 6: Teach in Handle 7: Teach in MPG 8: MPG 9: ZRN(M) 10: ZRN(P)
ready	2:ready	Discrete	CNC is ready
maclock	2:machine-lock	Discrete	Machine lock status
auxlock	2:auxiliary-lock	Discrete	Auxiliary lock status
dryrun	2:dry-run	Discrete	Dry run status
sbk	2:single-block	Discrete	Single block status
opskip	2:optional-skip	Discrete	Optional skip status
opstop	2:optional-stop	Discrete	Optional stop status
almclass	3:almclass	Text (Array)	Alarm class
almcode	3:almcode	Text (Array)	Alarm code
posabs_0	4:0:absolute	Analog	Read 1st absolute position information
posmac_0	4:0:machine	Analog	Read 1st machine position information
posrel_0	4:0:relative	Analog	Read 1st relative position information
posdis_0	4:0:dist-to-go	Analog	Read 1st distance to go information
posabsar	4:absolute	Analog (Array)	Read all absolute position information by array
posmacar	4:machine	Analog (Array)	Read all machine position information by array
posrelar	4:relative	Analog (Array)	Read all relative position information by array
posdisar	4:dist-to-go	Analog (Array)	Read all distance to go information by array

Table 4.33: KND CNC Driver Tag List			
servload	5:servload	Analog (Array)	Read servo load
spinload	6:spinload	Analog (Array)	Read spindle load
cyccur	7:cur	Analog	Current cycle time (sec)
cycctl	7:total	Analog	Read/reset total cycle time (sec)
powtol	8:abso-lute:online	Analog	Total power on time (sec)
runtol	8:absolute:run	Analog	Total operation time (sec)
cuttol	8:absolute:cut	Analog	Total cutting time (sec)
powrel	8:relative:online	Analog	Relative power on time (sec)
runrel	8:relative:run	Analog	Relative operation time (sec)
cutrel	8:relative:cut	Analog	Relative cutting time (sec)
runcyc	8:cycle:run	Analog	Cycle operation time (sec)
cutcyc	8:cycle:cut	Analog	Cycle cutting time (sec)
ptotal	9:total	Analog	Read/reset total part count
pcount	9:batch	Analog	Read/reset part count
ptreq	10:total	Analog	Read/write total required part count
preq	10:batch	Analog	Read/write required part count
ovfeed	11:ov	Analog	Read feed rate override
ovrapid	12:ov	Analog	Read rapid override
ovsp	13:ovsp	Analog (Array)	Read spindle override
spinsped	14:spinsped	Analog (Array)	Read spindle speed
feedrate	15:feedrate	Analog	Read feedrate
wc_g54	16:G54	Analog (Array)	Read G54 work coordinates data
wc_g55	16:G55	Analog (Array)	Read G55 work coordinates data
wc_g56	16:G56	Analog (Array)	Read G56 work coordinates data
wc_g57	16:G57	Analog (Array)	Read G57 work coordinates data
wc_g58	16:G58	Analog (Array)	Read G58 work coordinates data
wc_g59	16:G59	Analog (Array)	Read G59 work coordinates data
wc_cur	17:wccur	Analog (Array)	Read current work coordinates data
mar_100	18:100:mar	Analog (Array)	Read macro data 100~163
smar_999	97:999:smar	Analog	Write single macro data 999
gcode	19:gcode	Text (Array)	Read all data of G code at a time
geomttl	20:geotitle	Text (Array)	Read tool geom offset title
geom001	20:1:geom	Analog (Array)	Read tool 1 geom offset value

Table 4.33: KND CNC Driver Tag List			
geomdata	98:geomdata	Analog (Array)	Data of geom offset value
geomno	98:geomno	Analog	Set number of tool to write geom offset value
setgeom	98:setgeom	Discrete	Flag (0->1) from setting geom offset data to number of tool
weartitl	21:weatitle	Text (Array)	Read tool wear offset title
wear001	21:1:wear	Analog (Array)	Read tool 1 wear offset value
weardata	99:weardata	Analog (Array)	Data of wear offset value
wearno	99:wearno	Analog	Set number of tool to write wear offset value
setwear	99:setwear	Discrete	Flag (0->1) from setting wear offset data to number of tool
plc_x0	22:X0:u8	Analog	Read the PLC data of the specified address as X/Y/F/G/R/S/K/D/TL u8: 8 bits unsigned integral s8: 8 bits signed integral u16: 16 bits unsigned integral s16: 16 bits signed integral u32: 32 bits unsigned integral s32: 32 bits signed integral
runprog	23:O	Analog	Read currently program number (Oxxxx)
runseq	23:N	Analog	Read the currently sequence number of the NC program (Nxxxx)
blkpoint	23:P	Analog	Read the actual execution pointer
curnum	24:number	Analog	Read/write current program by using number
curname	24:name	Text	Read/write current program by using name
MASTATUS	MASTATUS	Discrete	CNC connection status 0: DISCONNECT 1: RUN (only for MEM mode) 2: IDLE 3: ALARM

Table 4.34: KND CNC Driver Error Codes	
Error Code	Description
0x8001	CURL error
0x8002	HTTP status code

Table 4.35: HEIDENHAIN iTNC530 Driver Tag List (LSV2)

Tag Name	Address	Type	Description
ncmodel	ncmodel	Text	TNC model
ncver	ncver	Text	NC version
plcver	plcver	Text	PLC version
optver	optver	Text	The version of additional options
axesname	axesname	Text (Array)	Read axes name
axestype	axestype	Text (Array)	Read axes type
posrefar	posrefar	Analog (Array)	Read all reference position by array
posactar	posactar	Analog (Array)	Read all actual position by array
posref0	posref:0	Analog	Read 1st reference position
posact0	posact:0	Analog	Read 1st actual position
opmode	opmode	Discrete	Operation mode 0: Manual 1: MDI 2: Hand wheel 3: Single step 4: Automatic 5: Other 6: Smart 7: Axes ref
programe	programe	Text	Name of the program selected in automatic
runseq	runseq	Analog	Read the currently sequence number of the NC program
ovfeed	ovfeed	Analog	Read feed rate override
ovspin	ovspin	Analog	Read spindle speed override
ovrapid	ovrapid	Analog	Read rapid override
progstat	progstat	Discrete	Program status 0: Started 1: Stopped 2: Finished 3: Canceled 4: Interrupted 5: Error 6: Error cleared 7: Idle
almnum	almnum	Text (Array)	Read alarm number by array
almmsg	almmsg	Text (Array)	Read alarm message by array
almclass	almclass	Text (Array)	Read alarm class by array
almgroup	almgroup	Text (Array)	Read alarm group by array
ncuptime	ncuptime	Text	NC uptime
muptime	muptime	Text	Machine uptime
mruntime	mruntime	Text	Machine running time
sruntime	sruntime	Text	Spindle running time

Table 4.35: HEIDENHAIN iTNC530 Driver Tag List (LSV2)

toolnum	toolnum	Analog	Tool number in use
toolaxis	toolaxis	Text	Tool axis
toollen	toollen	Analog	Tool length
toolrad	toolrad	Analog	Tool radius
mcode	plc:w260	Analog	Read M code by plc address
fcode	plc:d360	Analog	Read F code by plc address
tcode	plc:w264	Analog	Read T code by plc address
scode	plc:w320	Analog	Read S code by plc address
actfeed	plc:d388	Analog	Read actual feed rate by plc address
actspin	plc:w322	Analog (Array)	Read actual spindle speed by plc address
servload	plcs:w9772	Analog (Array)	Read servo load by plc address
servsped	plc:d9192	Analog (Array)	Read servo speed by plc address
servtemp	plc:w7216	Analog	Read servo temperature by plc address
spinload	plc:w9804	Analog	Read spindle load by plc address
spinsped	plc:w322	Analog	Read spindle speed by plc address
spintemp	plc:w7248	Analog	Read spindle temperature by plc address
spinvibr	plc:w16500	Analog	Read spindle vibration by plc address
pcount	plc:w20	Analog	Read part count by plc address
isalarm	plc:m4177	Discrete	Read alarm status by plc address
emg	plc:m4178	Discrete	Read emergency stop by plc address
getmpgm	getmpgm	Discrete	Flag (0->1) from getting a NC program as mqnc from CNC memory
mqnc	mqnc	Text	NC program name under the CNC mncdir folder
upmpgm	upmpgm	Discrete	Flag (0->1) from uploading a NC program as upmnc to CNC mncdir folder
upmnc	upmnc	Text	The file name or the name with the source path. EX 1: ABC.H (under the pgm folder) EX 2: C:\ncfiles\ABC.H
delmpgm	delmpgm	Discrete	Flag (0->1) from deleting a NC program as delmname under CNC mncdir folder
delmname	delmname	Text	The file name will be deleted under CNC mncdir folder
mncdir	mncdir	Text	The destination directory of CNC.
getmlist	getmlist	Discrete	Flag (0->1) from getting the NC program list under CNC mncdir folder including mdirname, mdirtime, mncname, mnctime and mnctime.
mdirname	mdirname	Text (Array)	Read the folder name under CNC mncdir folder by array
mdirtime	mdirtime	Text (Array)	Read the folder time under CNC mncdir folder by array
mncname	mncname	Text (Array)	Read NC program name under CNC mncdir folder by array
mnctime	mnctime	Text (Array)	Read NC program modification date under CNC mncdir folder by array

Table 4.35: HEIDENHAIN iTNC530 Driver Tag List (LSV2)

MASTATUS	MASTATUS	Discrete	CNC connection status 0: DISCONNECT 1: RUN (only for AUTO mode) 2: IDLE 3: ALARM
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Note!  When CNC manufacturer using Heidenhain iTNC 530 controller has different PLC address definition, the user can adjust the driver address to match the manufacturer PLC setting to get the correct tag's value.

Table 4.36: HEIDENHAIN TNC640 Driver Tag List (LSV2_640)

Tag Name	Address	Type	Description
ncmodel	ncmodel	Text	TNC model
ncver	ncver	Text	NC version
plcver	plcver	Text	PLC version
optver	optver	Text	The version of additional options
axesname	axesname	Text (Array)	Read axes name
axestype	axestype	Text (Array)	Read axes type
posrefar	posrefar	Analog (Array)	Read all reference position by array
posactar	posactar	Analog (Array)	Read all actual position by array
posref0	posref:0	Analog	Read 1st reference position
posact0	posact:0	Analog	Read 1st actual position
opmode	opmode	Discrete	Operation mode 0: Manual 1: MDI 2: Hand wheel 3: Single step 4: Automatic 5: Other 6: Smart 7: Axes ref
progname	progname	Text	Name of the program selected in automatic
runseq	runseq	Analog	Read the currently sequence number of the NC program
ovfeed	ovfeed	Analog	Read feed rate override
ovspin	ovspin	Analog	Read spindle speed override
ovrapid	ovrapid	Analog	Read rapid override

Table 4.36: HEIDENHAIN TNC640 Driver Tag List (LSV2_640)

progstat	progstat	Discrete	Program status 0: Started 1: Stopped 2: Finished 3: Canceled 4: Interrupted 5: Error 6: Error cleared 7: Idle
almnum	almnum	Text (Array)	Read alarm number by array
almmsg	almmsg	Text (Array)	Read alarm message by array
almclass	almclass	Text (Array)	Read alarm class by array
almgroup	almgroup	Text (Array)	Read alarm group by array
ncuptime	ncuptime	Text	NC uptime
muptime	muptime	Text	Machine uptime
mruntime	mruntime	Text	Machine running time
sruntime	sruntime	Text	Spindle running time
mcode	plc:w6295	Analog	Read M code by plc address
fcode	plc:d4420	Analog	Read F code by plc address
tcode	plc:d17972	Analog	Read T code by plc address
scode	plc:d18052	Analog	Read S code by plc address
actfeed	plc:d200	Analog	Read actual feed rate by plc address
actspin	plc:d336	Analog (Array)	Read actual spindle speed by plc address
servload	plcs:d192	Analog (Array)	Read servo load by plc address
servsped	plc:d252	Analog (Array)	Read servo speed by plc address
servtemp	plc:d188	Analog	Read servo temperature by plc address
spinload	plc:d304	Analog	Read spindle load by plc address
spinsped	plc:d344	Analog	Read spindle speed by plc address
spintemp	plc:d300	Analog	Read spindle temperature by plc address
spinvibr	plc:w16500	Analog	Read spindle vibration by plc address
pcount	plc:w10	Analog	Read part count by plc address
isalarm	plc:m68	Discrete	Read alarm status by plc address
emg	plc:m56	Discrete	Read emergency stop by plc address
getmpgm	getmpgm	Discrete	Flag (0->1) from getting a NC program as mqnc from CNC memory
mqnc	mqnc	Text	NC program name under the CNC mnkdir folder
upmpgm	upmpgm	Discrete	Flag (0->1) from uploading a NC program as upmnc to CNC mnkdir folder
upmnc	upmnc	Text	The file name or the name with the source path. EX 1: ABC.H (under the pgm folder) EX 2: C:\ncfiles\ABC.H

Table 4.36: HEIDENHAIN TNC640 Driver Tag List (LSV2_640)			
delmpgm	delmpgm	Discrete	Flag (0->1) from deleting a NC program as delmanme under CNC mnmdir folder
delmname	delmname	Text	The file name will be deleted under CNC mnmdir folder
mnmdir	mnmdir	Text	The destination directory of CNC.
getmlist	getmlist	Discrete	Flag (0 ->1) from getting the NC program list under CNC mnmdir folder including mdirname, mdirtime, mncname, mnctime and mncsize.
mdirname	mdirname	Text (Array)	Read the folder name under CNC mnmdir folder by array
mdirtime	mdirtime	Text (Array)	Read the folder time under CNC mnmdir folder by array
mncname	mncname	Text (Array)	Read NC program name under CNC mnmdir folder by array
mncsize	mncsize	Analog (Array)	Read NC program size under CNC mnmdir folder by array
mnctime	mnctime	Text (Array)	Read NC program modification date under CNC mnmdir folder by array
MASTATUS	MASTATUS	Discrete	CNC connection status 0: DISCONNECT 1: RUN (only for AUTO mode) 2: IDLE 3: ALARM


Note!  When CNC manufacturer using Heidenhain TNC 640 controller has different PLC address definition, the user can adjust the driver address to match the manufacturer PLC setting to get the correct tag's value.

Table 4.37: HEIDENHAIN LSV2 Driver Error Codes	
Error Code	Description
0x8001	Connection fail
0x8002	Incorrect tag address

Chapter 5

WebAccess/CNC
Driver for FANUC
Robot

5.1 About FANUC Robot

FANUC Robot Interface is the Windows software module to read/write robot data with robots over Ethernet. WebAccess/CNC driver for FANUC robot interface can access a robot's current position, position registers, string registers, comments, system variables, KAREL variables, program status and alarm history. FANUC Robot Interface does not directly support file transfer so an FTP client should be used instead.

5.1.1 Specification

Supports Robot Controllers List

- Fanuc Robot Controllers:
 - R-J3iB 7D80/45 or later
 - R-J3iB 7D81/09 or later
 - R-J3iB 7D82/01 or later
 - R-J3iB Mate 7D91/01 or later
 - R-30iA, R-30iA Mate All Versions (*)
 - R-30iB, R-30iB Mate All Versions (*)
 - R-30iB Plus, R-30iB Mate Plus, R-30iB Compact Plus All Versions (*)

(*) If R650 FRA Params is selected, R553 "HMI Device (SNPX)" is needed. If R651 FRL Params is selected, no option is needed

- Common Fanuc Robot:
 - LR Mate 200iD
 - M-10iA
 - M-20iA
 - M-710iC
 - R-2000iC
 - M-900iB
 - M-2000iA
 - M-410iC

5.2 Establish the CNC Driver for FANUC Robot

The steps in summary are:

1. Start Internet Explorer Web Browser.
2. Enter the IP address of the Project Node.
3. Use WebAccess configuration.
4. Open or create a project.
5. Configure a SCADA node (the PC that will connect to the automation hardware).
6. Configure a com port for the SCADA Node that is a TCP/IP type com port.

The TCP/IP Comport is usually associated with an Ethernet Network Interface Card on the SCADA Node PC. Any TCP/IP compatible medium is supported as long as it complies with Microsoft TCP/IP protocol stack. The user should give the setting for comport number, scan time, timeout, retry count, auto recover time and scan devices in parallel according to your actual connection requirements.

Comport Property Delete Add Device	
Comport : FANUC • ROBOT • 10	
Interface Name	TCPIP
Comport Number	10
Description	Description
Scan Time	1 Second
Timeout	1000 MilliSecond
Retry Count	3
Auto Recover Time	60 Second
Backup Port Number	0
Scan Devices in Parallel	Yes

For the “Add Device” step, the user needs to set the device name, unit number, device type and the IP address and port number by the FANUC robot controller setting. The default port number is not necessary for this robot driver.

Device Property		[Cancel]	Submit
Device Name	<input type="text" value="Robot01"/>		
Description	<input type="text"/>		
Unit Number	<input type="text" value="0"/>		
Device Type	FRobot ▼		
Primary	IP Address	<input type="text" value="10.9.132.33"/>	
	Port Number	<input type="text" value="0"/>	
	Device Address	<input type="text"/> if other than Unit Number	
Secondary	IP Address	<input type="text"/>	
	Port Number	<input type="text"/>	
	Device Address	<input type="text"/>	
Table1RefreshTimeMs:	<input type="text" value="1000"/>	Table2RefreshTimeMs:	<input type="text" value="5000"/>
IORefreshTimeMs:	<input type="text" value="1000"/>		

Table 1 Refresh TimeMs: 1000 ms

Set how often millisecond updates the point of Date Table1

Table 2 Refresh TimeMs: 5000 ms

Set how often millisecond updates the point of Date Table2

IO Refresh TimeMs: 1000 ms

Set how often millisecond updates the point of I/O

FANUC Robot's tags can be divided into I/O measuring points and Data Table measuring points. Data Table measuring points can be chosen to set two tables (Data Table1 & Data Table 2) to different sampling frequencies. The measurement points are preset on DataTable1. To set it to DataTable2, add "/2" at the end of tag address, as follows:

Eg.

CurPos.1.X/2

Alarm.Current.1.AlarmID/2

NumReg.1/2

The address of Fanuc Robot IO can be modified by the user's requirement. If the user want to read AI100 and RDI20, the user can add the two new tags AI100 & RDI20 and modify the address as:

Tags	Address
AI100	AI.100
RDI20	RDI.20

Fanuc Robot driver supports array tags for the current alarm and the history alarm. The user can set the size of the alarm tag to decide the array size. For example, the size of the tag "HAID1" is 100 that means the history alarm ID includes index 0 to 99.

5.3 CNC Driver List for FANUC Robot

Table 5.1: FANUC Robot Driver Tag List (I/O)

Tag Name	Address	Type	Description
ClearAlm	ClearAlarm	Discrete	Clear Robot's History Alarm
AI1	AI.1	Analog	Analog Input, AI(1)
AO1	AO.1	Analog	Analog Output, AO(1)
UI01	UI.1	Discrete	IMSTP (Emergency Stop)
UI02	UI.2	Discrete	HOLD
UI03	UI.3	Discrete	SFSPD (Safe Speed)
UI04	UI.4	Discrete	Cycle Stop
UI05	UI.5	Discrete	Fault Reset
UI06	UI.6	Discrete	Start
UI07	UI.7	Discrete	Home Signal
UI08	UI.8	Discrete	Enable
UI09	UI.9	Discrete	RSR/PNS 1
UI10	UI.10	Discrete	RSR/PNS 2
UI11	UI.11	Discrete	RSR/PNS 3
UI12	UI.12	Discrete	RSR/PNS 4
UI13	UI.13	Discrete	RSR/PNS 5
UI14	UI.14	Discrete	RSR/PNS 6
UI15	UI.15	Discrete	RSR/PNS 7
UI16	UI.16	Discrete	RSR/PNS 8
UI17	UI.17	Discrete	PNS strobe
UI18	UI.18	Discrete	Prod Start
UO01	UO.1	Discrete	Command Enable
UO02	UO.2	Discrete	System Ready
UO03	UO.3	Discrete	Program Running

Table 5.1: FANUC Robot Driver Tag List (I/O)			
U004	UO.4	Discrete	Program Paused
U005	UO.5	Discrete	Motion Held
U006	UO.6	Discrete	Fault
U007	UO.7	Discrete	At Perch
U008	UO.8	Discrete	TP Enable
U009	UO.9	Discrete	Battery Alarm
U010	UO.10	Discrete	Busy
U011	UO.11	Discrete	RSR/PNS 1 ACK/SNO
U012	UO.12	Discrete	RSR/PNS 2 ACK/SNO
U013	UO.13	Discrete	RSR/PNS 3 ACK/SNO
U014	UO.14	Discrete	RSR/PNS 4 ACK/SNO
U015	UO.15	Discrete	RSR/PNS 5 ACK/SNO
U016	UO.16	Discrete	RSR/PNS 6 ACK/SNO
U017	UO.17	Discrete	RSR/PNS 7 ACK/SNO
U018	UO.18	Discrete	RSR/PNS 8 ACK/SNO
U019	UO.19	Discrete	PNS Enable SNACK
U020	UO.20	Discrete	Reserve
RDI1	RDI.1	Discrete	Robot Digital Input, RI(1)
RDO1	RDO.1	Discrete	Robot Digital Output, RO(1)
SDI1	SDI.1	Discrete	System Digital Input, DI(1)
SDO1	SDO.1	Discrete	System Digital Output, DO(1)
GI1	GI.1	Analog	Group Input, GI(1)
GO1	GO.1	Analog	Group Output, GO(1)
SI0	SI.0	Discrete	SOP Input, SI(0)
SO0	SO.0	Discrete	SOP Output, SO(0)
WI1	WI.1	Analog	WI Register, WI(1)
WO1	WO.1	Analog	WO Register, WO(1)
WSI1	WSI.1	Analog	WSI Register, WSI(1)
D1	D.1	Analog	D Register 1
K1	K.1	Analog	K Register 1
R1	R.1	Analog	R Register 1

Table 5.2: FANUC Robot Driver Tag List (Data Table)			
Tag Name	Address	Type	Description
CPX_G1	CurPos.1.X	Analog	Current Position X_G1
CPY_G1	CurPos.1.Y	Analog	Current Position Y_G1
CPZ_G1	CurPos.1.Z	Analog	Current Position Z_G1
CPW_G1	CurPos.1.W	Analog	Current Position W_G1
CPP_G1	CurPos.1.P	Analog	Current Position P_G1
CPR_G1	CurPos.1.R	Analog	Current Position R_G1
CPJ1_G1	CurPos.1.J1	Analog	Current Position J1_G1
CPJ2_G1	CurPos.1.J2	Analog	Current Position J2_G1
CPJ3_G1	CurPos.1.J3	Analog	Current Position J3_G1
CPJ4_G1	CurPos.1.J4	Analog	Current Position J4_G1
CPJ5_G1	CurPos.1.J5	Analog	Current Position J5_G1
CPJ6_G1	CurPos.1.J6	Analog	Current Position J6_G1

Table 5.2: FANUC Robot Driver Tag List (Data Table)			
UFX_11	CurPosUF.1.1.X	Analog	User Frame X_G1_UF1
UFY_11	CurPosUF.1.1.Y	Analog	User Frame Y_G1_UF1
UFZ_11	CurPosUF.1.1.Z	Analog	User Frame Z_G1_UF1
UFW_11	CurPosUF.1.1.W	Analog	User Frame W_G1_UF1
UFP_11	CurPosUF.1.1.P	Analog	User Frame P_G1_UF1
UFR_11	CurPosUF.1.1.R	Analog	User Frame R_G1_UF1
UFJ1_11	CurPosUF.1.1.J1	Analog	User Frame J1_G1_UF1
UFJ2_11	CurPosUF.1.1.J2	Analog	User Frame J2_G1_UF1
UFJ3_11	CurPosUF.1.1.J3	Analog	User Frame J3_G1_UF1
UFJ4_11	CurPosUF.1.1.J4	Analog	User Frame J4_G1_UF1
UFJ5_11	CurPosUF.1.1.J5	Analog	User Frame J5_G1_UF1
UFJ6_11	CurPosUF.1.1.J6	Analog	User Frame J6_G1_UF1
PRX_11	PosReg.1.1.X	Analog	Position Register Group1_Index1_X
PRY_11	PosReg.1.1.Y	Analog	Position Register Group1_Index1_Y
PRZ_11	PosReg.1.1.Z	Analog	Position Register Group1_Index1_Z
PRW_11	PosReg.1.1.W	Analog	Position Register Group1_Index1_W
PRP_11	PosReg.1.1.P	Analog	Position Register Group1_Index1_P
PRR_11	PosReg.1.1.R	Analog	Position Register Group1_Index1_R
PRJ1_11	PosReg.1.1.J1	Analog	Position Register Group1_Index1_J1
PRJ2_11	PosReg.1.1.J2	Analog	Position Register Group1_Index1_J2
PRJ3_11	PosReg.1.1.J3	Analog	Position Register Group1_Index1_J3
PRJ4_11	PosReg.1.1.J4	Analog	Position Register Group1_Index1_J4
PRJ5_11	PosReg.1.1.J5	Analog	Position Register Group1_Index1_J5
PRJ6_11	PosReg.1.1.J6	Analog	Position Register Group1_Index1_J6
CAID1	Alarm.Current.1.AlarmID	Analog (Array)	Current Alarm1 ID
CANum1	Alarm.Current.1.AlarmNumber	Analog (Array)	Current Alarm1 Number
CAMes1	Alarm.Current.1.AlarmMessage	Text (Array)	Current Alarm1 Message
CACID1	Alarm.Current.1.CauseAlarmID	Analog (Array)	Current Alarm1 Cause Alarm ID
CACNo1	Alarm.Current.1.CauseAlarm-Number	Analog (Array)	Current Alarm1 Cause Alarm Number
CACMe1	Alarm.Current.1.CauseAlarm-Message	Text (Array)	Current Alarm1 Cause Alarm Message
CASer1	Alarm.Current.1.Severity	Analog (Array)	Current Alarm1 Severity

Table 5.2: FANUC Robot Driver Tag List (Data Table)			
CASMe1	Alarm.Current.1.SeverityMes- sage	Text (Array)	Current Alarm1 Severity Mes- sage
CAYea1	Alarm.Current.1.Year	Analog (Array)	Current Alarm1 Year
CAMon1	Alarm.Current.1.Month	Analog (Array)	Current Alarm1 Month
CADay1	Alarm.Current.1.Day	Analog (Array)	Current Alarm1 Day
CAHou1	Alarm.Current.1.Hour	Analog (Array)	Current Alarm1 Hour
CAMin1	Alarm.Current.1.Minute	Analog (Array)	Current Alarm1 Minute
CASec1	Alarm.Current.1.Second	Analog (Array)	Current Alarm1 Second
HAID1	Alarm.History.1.AlarmID	Analog (Array)	History Alarm1 ID
HANum1	Alarm.History.1.AlarmNumber	Analog (Array)	History Alarm1 Number
HAMes1	Alarm.History.1.AlarmMessage	Text (Array)	History Alarm1 Message
HACID1	Alarm.History.1.CauseAlarmID	Analog (Array)	History Alarm1 Cause Alarm ID
HACNo1	Alarm.History.1.CauseAlarm- Number	Analog (Array)	History Alarm1 Cause Alarm Number
HACMe1	Alarm.History.1.CauseAlarm- Message	Text (Array)	History Alarm1 Cause Alarm Message
HASer1	Alarm.History.1.Severity	Analog (Array)	History Alarm1 Severity
HASMe1	Alarm.History.1.SeverityMes- sage	Text (Array)	History Alarm1 Severity Mes- sage
HAYea1	Alarm.History.1.Year	Analog (Array)	History Alarm1 Year
HAMon1	Alarm.History.1.Month	Analog (Array)	History Alarm1 Month
HADay1	Alarm.History.1.Day	Analog (Array)	History Alarm1 Day
HAHou1	Alarm.History.1.Hour	Analog (Array)	History Alarm1 Hour
HAMin1	Alarm.History.1.Minute (Array)	Analog	History Alarm1 Minute
HASec1	Alarm.History.1.Second (Array)	Analog	History Alarm1 Second
NUM_R1	NumReg.1	Analog	Number Register 1
SVI_FNo	SysVar.Int.\$MNUFRAME- NUM[1]	Analog	System INT Variable_Fra- meNumber
SVI_TNo	SysVar.Int.\$MNUTOOLNUM[1]	Analog	System INT Variable_ToolNum- ber
SVI_OV	SysVar.Int.\$MCR.\$GENOVER- RIDE	Analog	System INT Variable_Override
SVI_PowT	SysVar.Int.\$SYSTEM_- TIME[1].PWR_TOT	Analog	System INT Variable_OnPower- Time

Table 5.2: FANUC Robot Driver Tag List (Data Table)

SVI_SOnT	SysVar.Int.\$SYSTEM_- TIME[1].SRV_TOT	Analog	System INT Variable_ServoOn- Time
SVI_RunT	SysVar.Int.\$SYSTEM_- TIME[1].RUN_TOT	Analog	System INT Variable_Running- Time
SVI_WaiT	SysVar.Int.\$SYSTEM_- TIME[1].WIT_TOT	Analog	System INT Variable_Waiting- Time
SVI_FC	SysVar.Int.\$FAST_CLOCK	Analog	System INT Variable_FastClock
SVF_G1PL	Sys- Var.Float.\$PLST_GRP1[1].\$PA YLOAD	Analog	System FLOAT Vari- able_G1Payload
SVF_DT	SysVar.Float.\$DUTY_TEMP	Analog	System FLOAT Variable_Duty Temperature
SVS_Ver	SysVar.String.\$VERSION	Text	System STRING Variable_Ver- sion
TNLine1	Task.Normal.1.LineNumber	Analog	Task 1 Normal Line Number
TNS1	Task.Normal.1.State	Analog	Task 1 Normal State
TNPP1	Task.Normal.1.Parent- ProgName	Text	Task 1 Normal Parent Program Name
TNProg1	Task.Normal.1.ProgName	Text	Task 1 Normal Program Name
STR_R1	String.13.1	Text	String Register 1
CM_STR1	String.14.1	Text	Comment of String Register 1
CM_NUM1	String.15.1	Text	Comment of Number Register 1
CM_POS1	String.16.1	Text	Comment of Position Register 1
CM_SDI1	String.17.1	Text	Comment of SDI 1
CM_SDO1	String.18.1	Text	Comment of SDO 1
CM_RDI1	String.19.1	Text	Comment of RDI 1
CM_RDO1	String.20.1	Text	Comment of RDO 1
CM_UI1	String.21.1	Text	Comment of UI 1
CM_UO1	String.22.1	Text	Comment of UO 1
CM_SI1	String.23.1	Text	Comment of SI 1
CM_SO1	String.24.1	Text	Comment of SO 1
CM_WI1	String.25.1	Text	Comment of WI 1
CM_WO1	String.26.1	Text	Comment of WO 1
CM_WSI1	String.27.1	Text	Comment of WSI 1
CM_GI1	String.29.1	Text	Comment of GI 1
CM_GO1	String.30.1	Text	Comment of GO 1
CM_AI1	String.31.1	Text	Comment of AI 1
CM_AO1	String.32.1	Text	Comment of AO 1

Table 5.3: FANUC Robot Driver Error Codes

Error Code	Description
0x8001	Illegal tag address
0x8002	Can't call Fanuc Library
0x8003	Connection failed
0x8004	Invalid refresh object
0x8005	Invalid item value
0x8006	Failed while reading I/O
0x8008	Failed when creating dispatch
0x8009	Refresh object failed
0x8B00	The measured value is not initialized
0x8C00	Driver executable file is not executed

Appendix **A**

Other Instructions

A.1 FANUC Alarm Messages of WebAccess/CNC

By default, WebAccess/CNC alarm messages for FANUC series machines are in English. You can copy the built-in EN/TC/SC alarm message files (the default path is C:\WebAccess\Node\WebAccessCNC\message) and change the file name “alarm-Message.ini” and copy it to the device folder in your SCADA project (ex: C:\WebAccess\Node\Project name_Node name\pgm\Device name).

You can also modify the message to suit specific CNC applications or user needs.

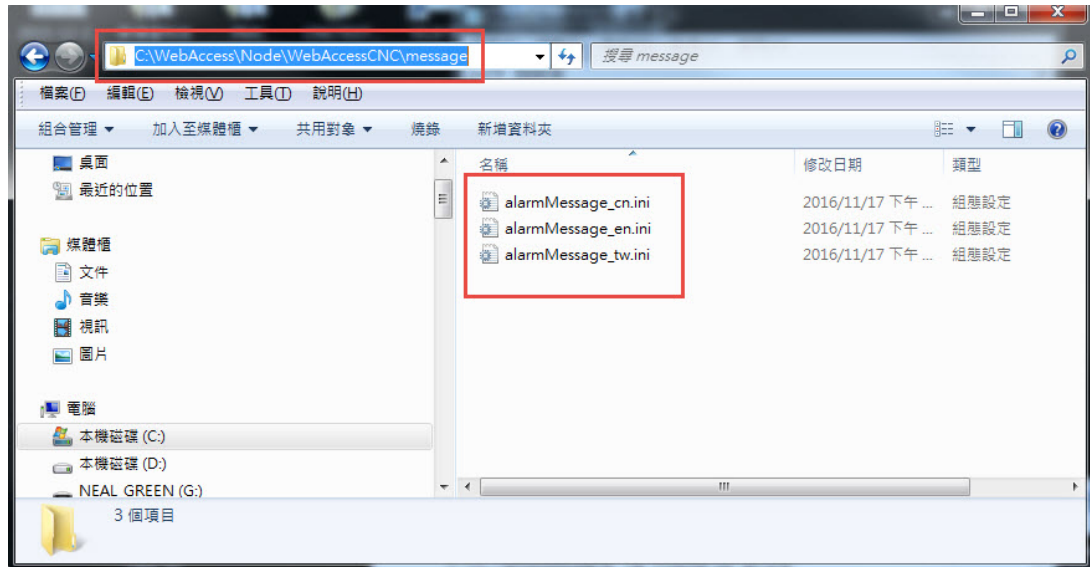


Figure A.1 EN/TC/SC Alarm Message Files for FANUC

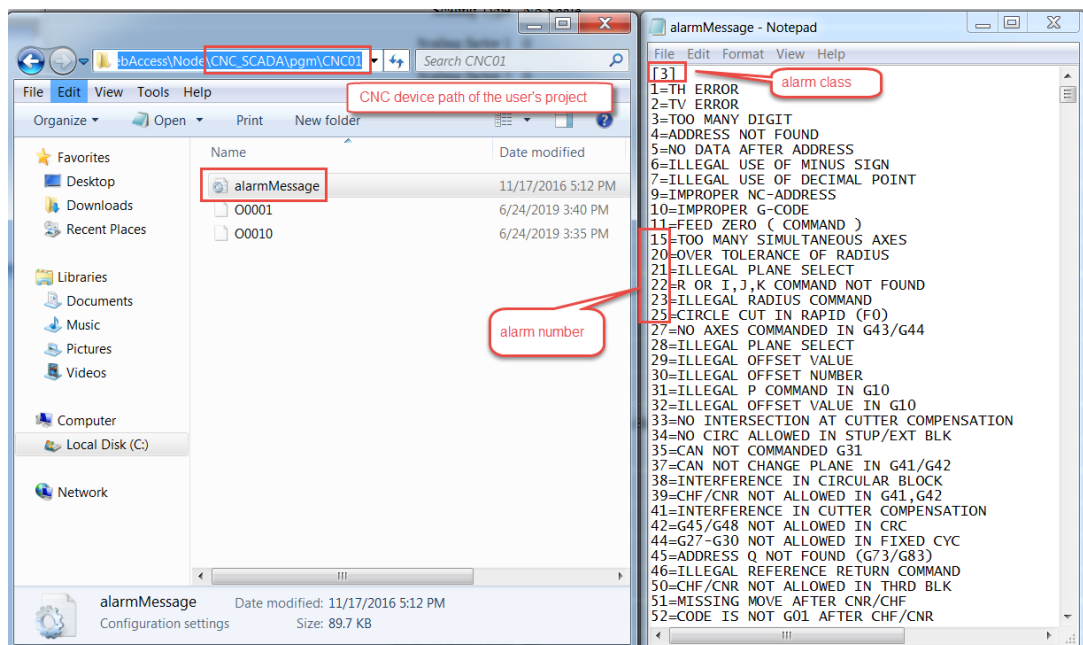


Figure A.2 Default Alarm Message File Location

Table A.1: FANUC Alarm Class List		
Alarm List	Class Number	Description
(SW)	0	Parameter switch on
(PW)	1	Power off parameter set
(IO)	2	I/O error
(PS)	3	Foreground P/S
(OT)	4	Over travel, external data
(OH)	5	Overheat alarm
(SV)	6	Servo alarm
(SR)	7	Data I/O error
(MC)	8	Macro alarm
(SP)	9	Spindle alarm
(DS)	10	Other alarm (DS)
(IE)	11	Alarm concerning malfunction prevention
(BG)	12	Background P/S
(SN)	13	Synchronized error
?	14	(reserved)
(EX)	15	External alarm message
(PC)	19	PMC error
	20~31	(Not used)

A.2 User Password and User Access Levels for SIEMENS OPC UA

You can use OPC UA client software as UaExpert to modify the user password and user access level for SIEMENS OPC UA machines. First, you should enter the system administrator password (default password = “OpcUaClient”) and activate OPC UA in the SIEMENS OPC UA configuration dialog box, as follows:



Figure A.3 SIEMENS OPC UA Configuration

When using UaExpert to connect to SIEMENS OPC UA machines, you can change the administrator password, as follows:

Path: Root\Objects\Sinumerik\Methods\ChangeMyPassword

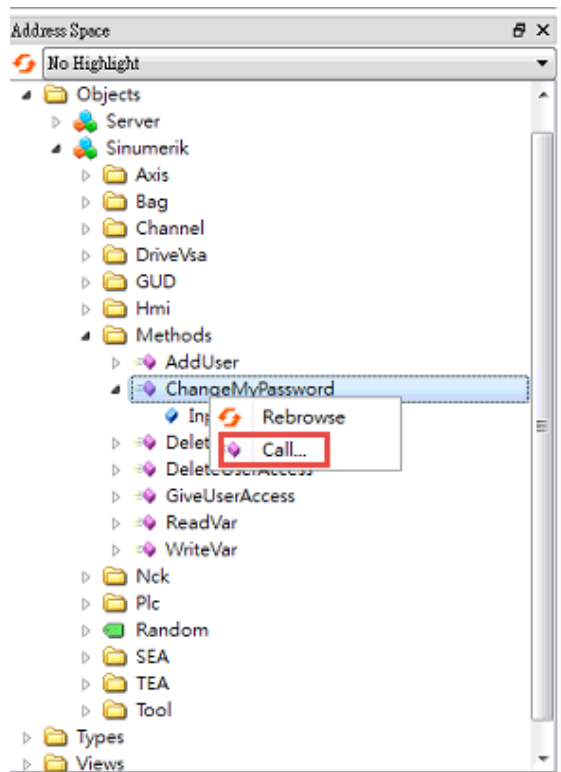


Figure A.4 Calling the ChangeMyPassword Object

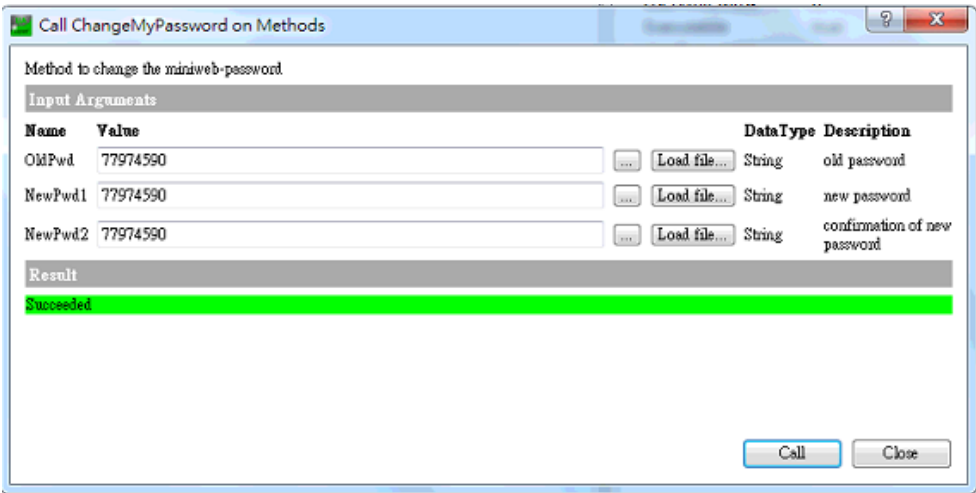


Figure A.5 Changing the Administrator Password

To change the user access level, you should add a new user named “WebAccess” when using UaExpert to connect SIEMENS OPC UA machines, as follows:

Path: Root\Objects\Sinumerik\Methods\AddUser

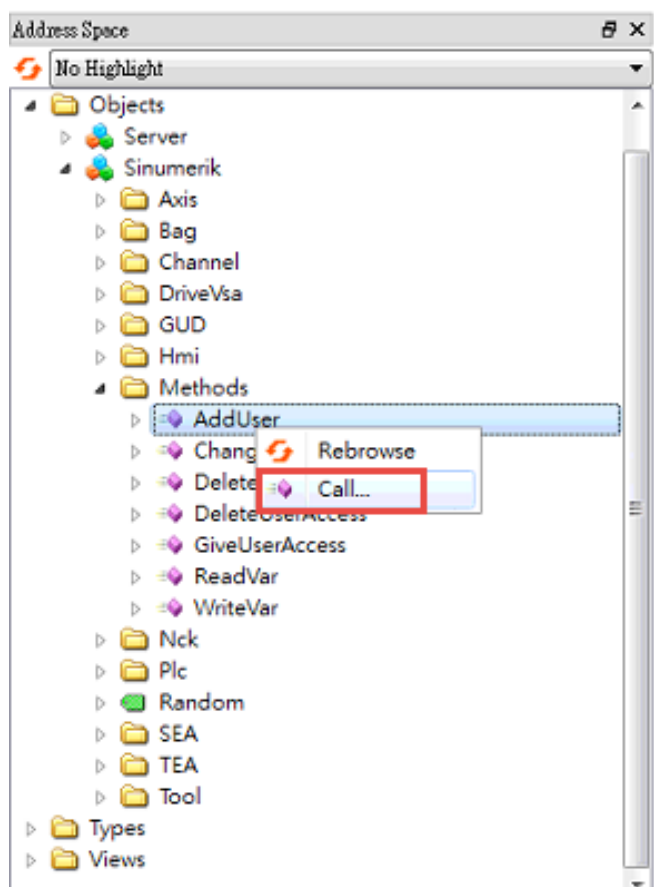


Figure A.6 Calling the AddUser Object

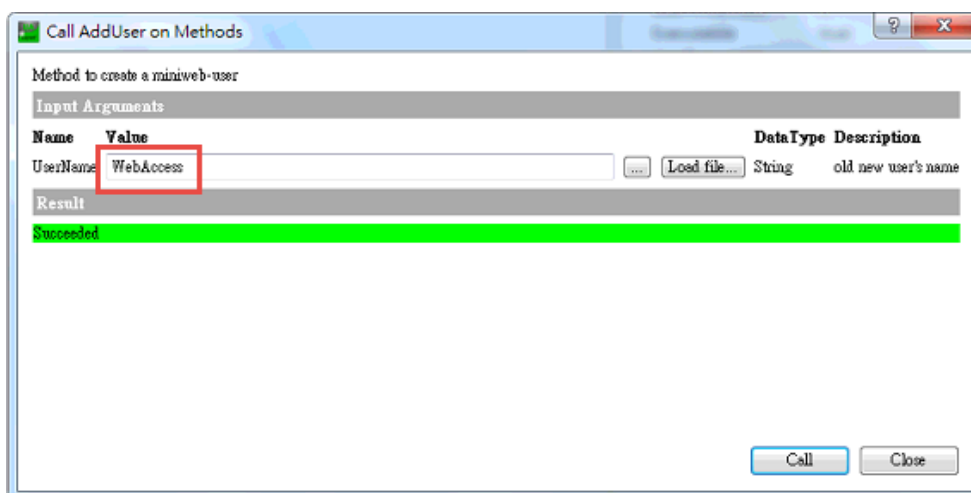


Figure A.7 Adding a New Administrator Account

After adding a new user as “WebAccess”, you can modify the user access level to be read and write, as follows:
Path: Root\Objects\Sinumerik\Methods\GiveUserAccess

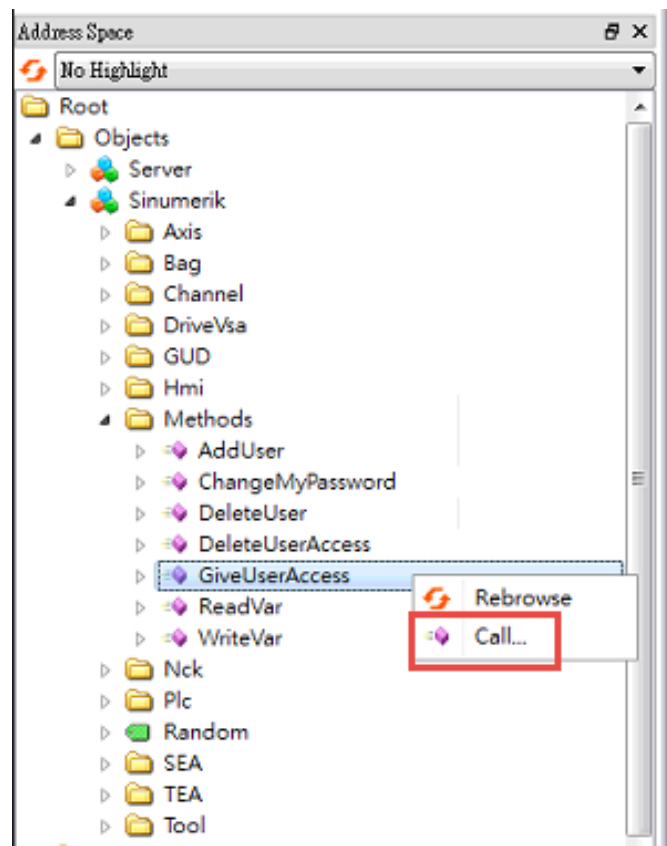


Figure A.8 Calling the ChangeMyPassword Object

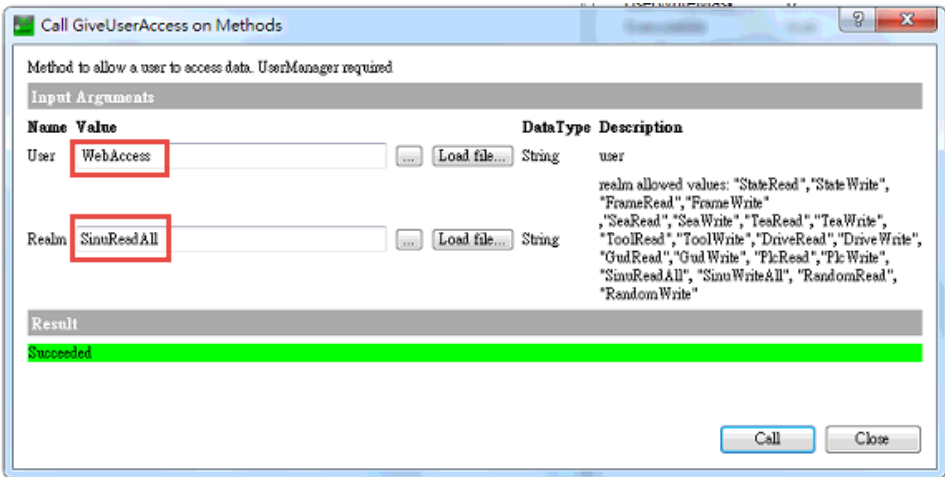


Figure A.9 Giving Read Access to an Administrator Account

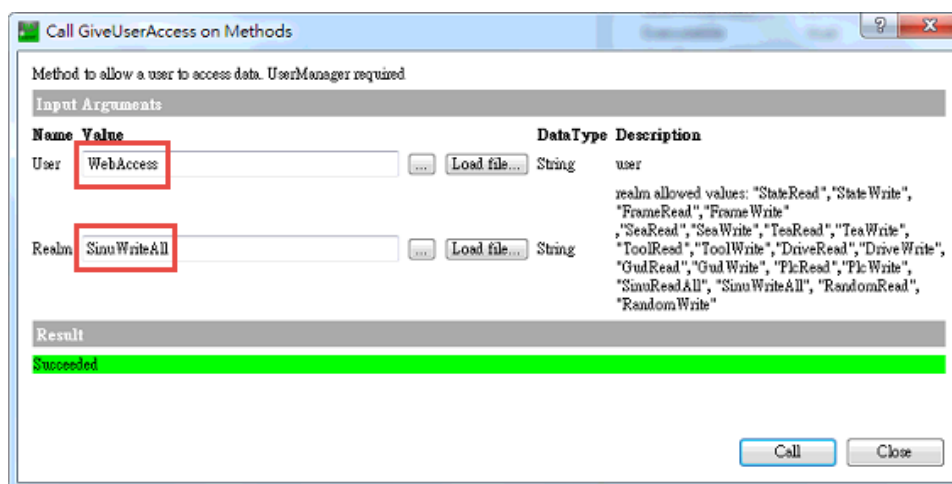


Figure A.10 Giving Write Access to an Administrator Account

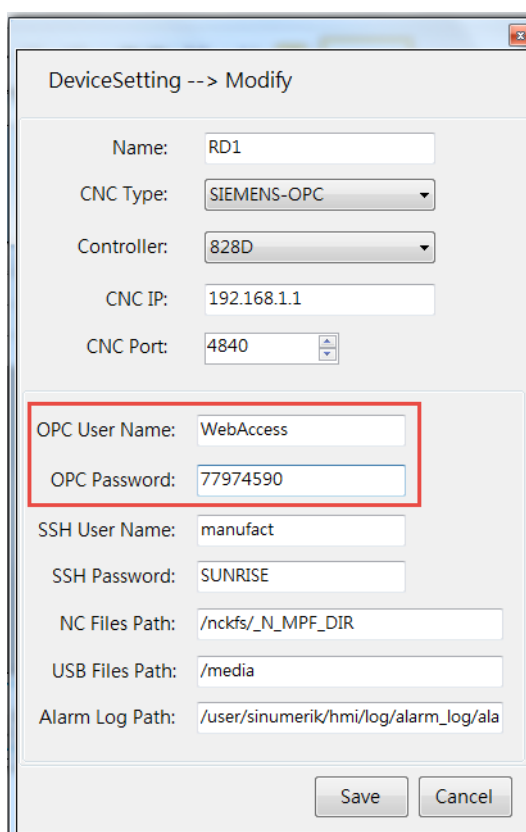
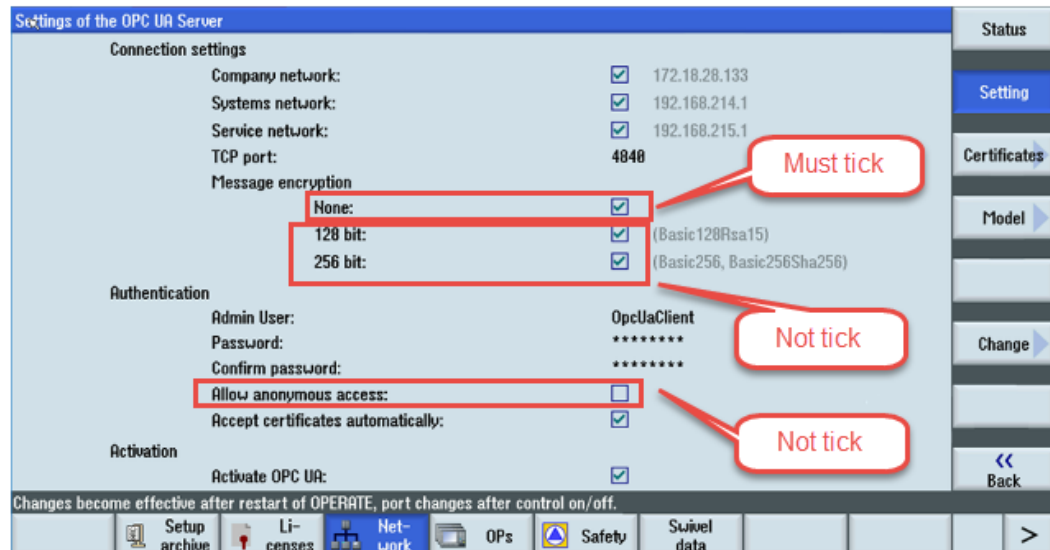


Figure A.11 SIEMENS OPC UA Username/Password (CNC Device Settings)

WebAccess CNC runtime is only designed to support Siemens OPC UA V4.5 and V4.7. They do not support communication signing and encryption. Please note that in the OPC UA setting in Siemens CNC, "Message Encryption" should only be set "None" and should not allow anonymous access in "Authentication". However, WebAccess CNC driver is designed to support Siemens OPC UA V4.5, V4.7 and V4.8. The communication signing and encryption are supported when using WebAccess CNC driver.



A.3 How to use DPRNT for FANUC CNC

For RS232 applications, the user needs to set the relative CNC parameters with the communication settings specified by WebAccess/CNCdriver. We recommend customers to use the first set of RS232 for general purpose on CNCs to avoid customers already having other applications such as touch panels in the second set of RS232. The specified parameter settings of communication with FANUC CNC series are listed as FANUC series 16/18/21, 0i, 16i/18i/21i, 30i/31i/32i & FANUC power mate, power mate i.

Parameter No	Setting value	Explanation
0000#1 (ISO)	1 (recommend)	Data output code (ISO)
0020	0 (recommend)	Channel 0 for data output
0110#0 (IO4)	0	I/O channels not separately controlled
0101#0 (SB2)	1 (recommend)	Channel 0: Stop bits is 2
0101#3 (ASI)	0 (recommend)	Channel 0: ISO code
0101#7 (NFD)	1 (recommend)	Channel 0: No feed output
0102	0	Channel 0: RS232-C (DC1 to DC4)
0103	10 (recommend)	Channel 0: 4800 bps
6001#1 (PRT)	1 (recommend)	Don't output space
6001#4 (CRO)	0 (recommend)	Output only "LF" after data is output

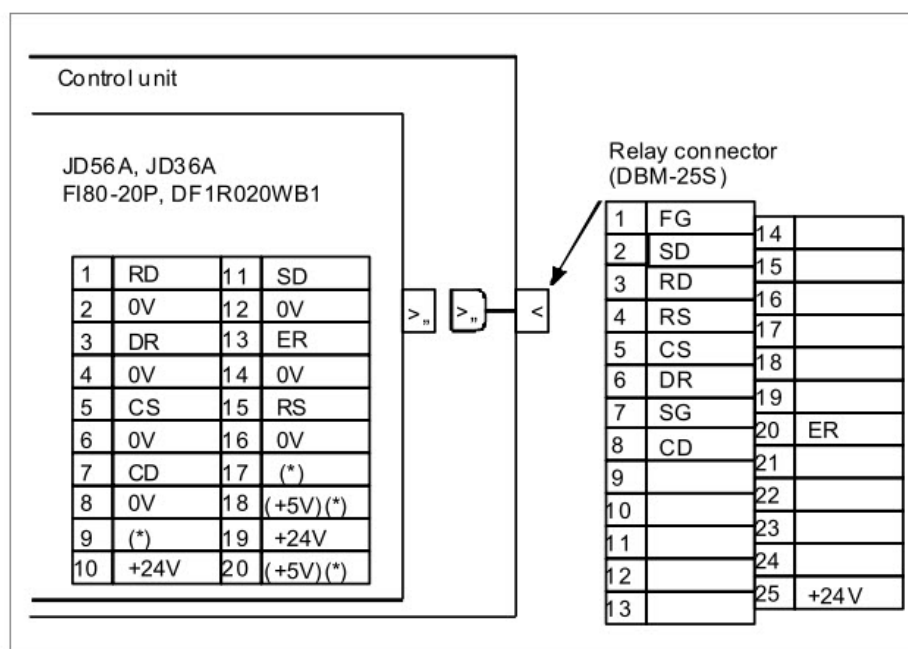
Please refer the FANUC connection manual (hardware) about the RS232 interface and the connector definition.

10.4" LCD unit and 8.4" LCD/MDI unit

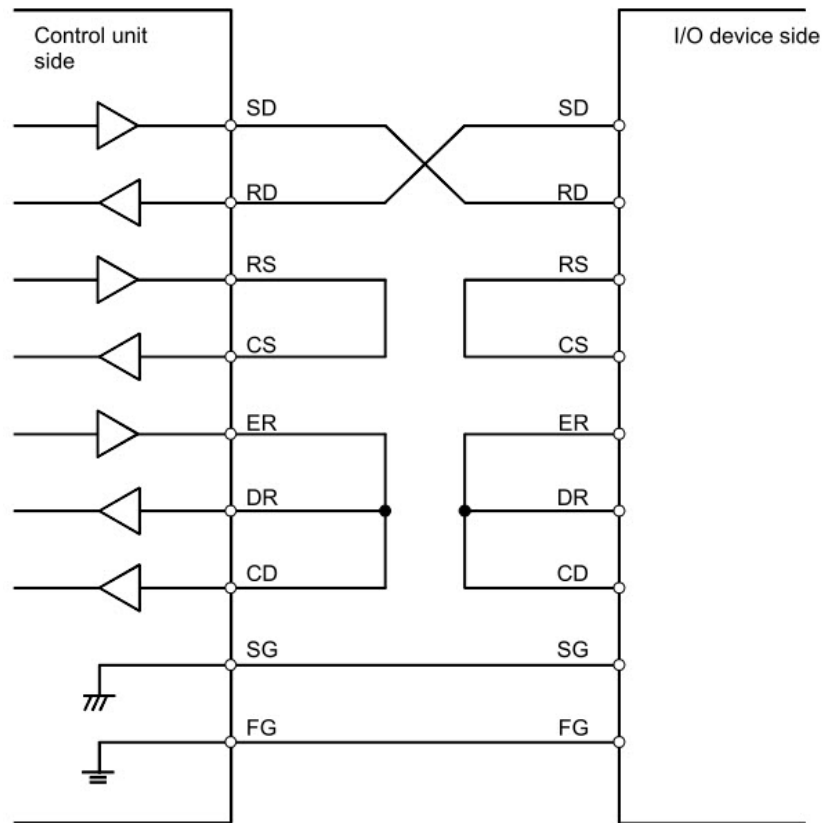
Port name	Interface location	I/O Channel
1CH (JD36A)	Main control unit	0, 1
2CH (JD36B)	Main control unit	2

15" LCD unit

Port name	Interface location	I/O Channel
1CH (JD56A)	Main control unit	0, 1
2CH (JD36A)	Main control unit	2



The RS232 cable (non-handshaking) is suitable for FANUC DPRNT application as



Macro commands available in FANUC CNC allow the CNC to output information while it runs. The user can use a DPRNT command to output data to a terminal or serial printer. The relative macro commands as the following order:

Open command: **POPEN**

Data output command: **DPRNT**

Close command: **PCLOS**

These external output commands can be specified for an external input/output device including RS232-C, memory card, USB memory, data server and embedded Ethernet by the FANUC I/O channel parameter. Using DPRNT command, FANUC CNC can output characters and each digit in the value of a variable. The data command DPRNT is shown as DPRNT[a#b[cd]]

a: character

#b: variable

c: number of significant digits in the integer part

d: number of significant decimal places

The commanded character string is output as it is by the ISO code. Alphanumerics (A to Z, 0 to 9) and special characters (+, -, *, /) can be used. Note that asterisk (*) is output as a space code.

For the use of WebAccess driver, specify that one variable per line is allowed when using DPRNT and use * to make a space between the tag address and the variable or the characters. In the WebAccess project, you can use **a** to be the tag's address when using the DPRNT driver. We will recommend that the address has the same word length to avoid the problem of misjudgment of the address name. Suggested samples are as follows:

Tag's name	Tag's address	Type
MNName	STRING001	Text
PNName	STRING002	Text
NCDate	STRING003	Text
NCTime	STRING004	Text
...	...	Text
pcount	ANALOG001	Analog
prequire	ANALOG 002	Analog
...	...	Analog

In the FANUC CNC, customers can add the designed subprogram and use M98 to call the subprogram in the proper program flow to output the desired data via RS232 interface. For example, the subprogram (O6000) including DPRNT commands is listed as:

```
%
O6000
POPEN
DPRNT[STRING001*0BCL110601]           (output characters sample)
DPRNT[STRING002*TR082017]           (output characters sample)
DPRNT[ANALOG001*#3901[80]]         (output variable's value sample)
DPRNT[ANALOG002*#3902[80]]         (output variable's value sample)
DPRNT[.....]                          (output other data)
PCLOS
M99
%
```

In the WebAccess, customers can add the serial port and set the device as the device type "DPRNT". The parameter "Line Indicator" is decided by the CNC parameter 6001#4(CRO) setting. When only using "LF", the line indicator should be set to **0x0a**. When using "LF" and "CR", the line indicator should be set to **0x0a8d**. The "Idle Timeout" is used to determine the time out value. When the set time out is exceeded, the tag's value will be cleared. If customers want to keep the last tag's value even the set time out is exceeded, the "Idle Timeout" can be set to **0** to disable the time out function.

When connecting to FANUC CNC RS232 interface, please use a PC's RS232 or Advantech EKI serial device **instead of using the USB to RS232 converter** to avoid the packet to be unreadable situation.

Create New Comport

[\[Cancel\]](#)

Submit

Interface Name

SERIAL

Comport Number

7

Description

Description

Baud Rate

4800

bps

Data Bit

☐ 7
☒ 8 bits

Stop Bit

☐ 1
☒ 2 bits

Parity

☒ None
☐ Odd
☐ Even

Scan Time

1

☐ MilliSecond
☒ Second
☐ Minute
☐ Hour

Timeout

1000

MilliSecond

Retry Count

3

Auto Recover Time

60

Second

HandShakeRts

☐ Yes
☒ No

HandShakeDtr

☐ Yes
☒ No

Backup Port Number

0

[\[Cancel\]](#)

Submit

Create New Device

[\[Cancel\]](#)

Submit

Device Name

F01_COM

Description

Unit Number

0

Device Type

DPRNT

Line Indicator

0x0a

Idle Timeout(s):

60

[\[Cancel\]](#)

Submit

The error code of the DRPNT driver is defined as

Code	Meaning
0x8001	Internal error
0x8002	Line indicator format error
0x8003	COM port error
0x8004	No tag's value obtained under this device
0x8101	No tag's value obtained
0x8102	ISO code transcoding error

A.4 Supported CNC Functions List

Table A.2: Supported CNC Functions List -1				
Connection method	CNC Runtime			
CNC controller	FANUC	MITSUBISHI	SIEMENS	HEIDENHAIN
Coordinate	○	○	○	○
G Code & Other Code	○	○	○	○
Part Count	○	○	○	○
Operation Time	○	○	○	○
Information	○	○	○	○
Status	○	○	○	○
Spindle & Servo Axes	○	○	○	○
Alarm	○	○	○	○
Message	○			
Macro	○	○	○	
Work Coordinator	○	○	○	
Tool Offset	○	○	○	○
Tool Life				
PLC register	○	○	○	○
NC Transfer	DNC tool	DNC tool	DNC tool	DNC tool

Table A.3: Supported CNC Functions List -2				
Connection method	CNC Driver			
CNC controller	FANUC	MITSUBISHI	SIEMENS OPC UA	SIEMENS S7/TCP
Coordinate	○	○	○	
G Code & Other Code	○	○	Δ	
Part Count	○	○	○	
Operation Time	○	○	○	
Information	○	○	○	○
Status	○	○	○	○
Spindle & Servo Axes	○	○	Δ	Δ
Alarm	○	○	○	Δ
Message	○	Δ		
Macro	○	○	○	
Work Coordinator	○	○	○	
Tool Offset	○	○		
Tool Life	○	○		
PLC register	○	○	○	○
NC Transfer	DNC tool	DNC tool	DNC tool	

Table A.4: Supported CNC Functions List -3

Connection method	CNC Driver			
CNC controller	HEIDENHAIN LSV2	brother	OKUMA	Haas
LSV2				
Coordinate	○	○	○	
G Code & Other Code	Δ	Δ	Δ	
Part Count	○	○	○	○
Operation Time	○	○	○	○
Information	○	○	○	○
Status	○	○	○	○
Spindle & Servo Axes	○	Δ	○	Δ
Alarm	○	○	○	Δ
Message				
Macro		○	○	○
Work Coordinator		○	Δ	
Tool Offset		○	Δ	
Tool Life		○		
PLC register	○	○		
NC Transfer	○	DNC tool	Shared folder	

Table A.5: Supported CNC Functions List -4

Connection method	CNC Driver			
CNC controller	LNC	SYNTEC	FAGOR	Roders
Coordinate	○	○	○	
G Code & Other Code	○		Δ	
Part Count	○	○	○	○
Operation Time			○	○
Information	○	○	○	○
Status	○	○	○	Δ
Spindle & Servo Axes	Δ	○	Δ	
Alarm	Δ	○	Δ	
Message	Δ			
Macro			○	
Work Coordinator	○		○	
Tool Offset				
Tool Life				
PLC register	○			
NC Transfer		DNC tool	Shared folder	Shared folder

Table A.6: Supported CNC Functions List -5		
Connection method	CNC Driver	
Robot controller	FANUC	KUKA
Coordinate	○	○
System variable	○	○
Operation Time	○	○
Information	○	○
Status	○	○
Alarm	○	
PLC register	○	○
File Transfer	FTP	FTP

○: Supported function

△: Partial supported function



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