SYNTEC TECHNOLOGY CO.,LTD.

RemoteAPI Operation Manual

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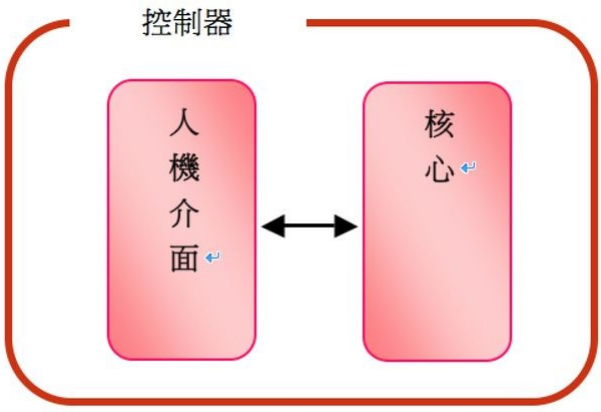
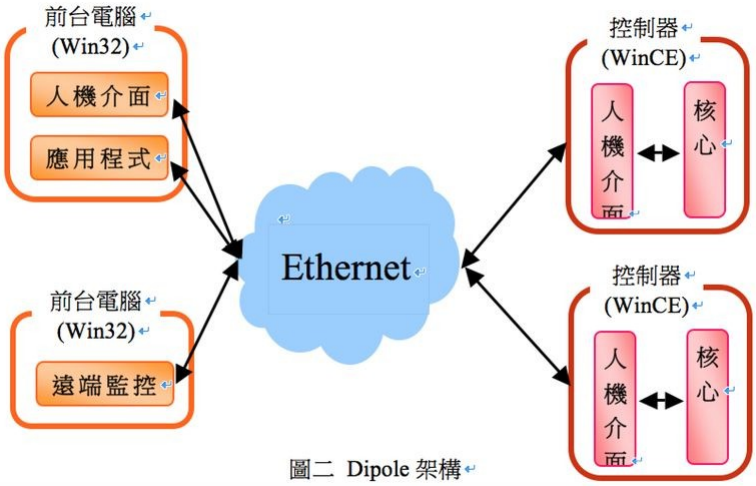
1 System Introduction

1.1 Solution Architecture

The new generation Dipole function separates the man-machine from the core (Figure 1 and Figure 2), allowing users to control the back-end controllers from the front-end applications (e.g., standard man-machines) via the Internet. Users can use this architecture for remote monitoring and remote diagnosis. The front-end application development environment is no longer limited to Windows CE, but can be developed for Windows XP, Windows 7, ... general applications, thus creating unlimited possibilities.



圖一 控制器原有架構



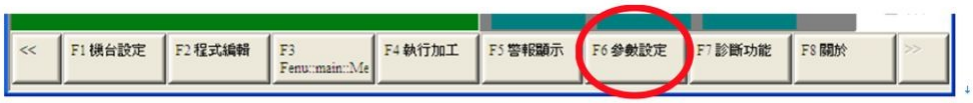
圖二 Dipole 架構

This manual teaches users how to install the CNC simulation software on the front-end Windows user and start using the RemoteCNC One-to-Many API features.

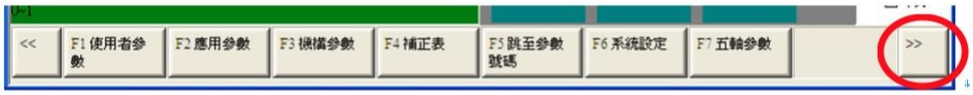
1.2 How to switch on Dipole via HMI controller

The server is positioned in the panel FenuBar: (varies slightly depending on the controller)

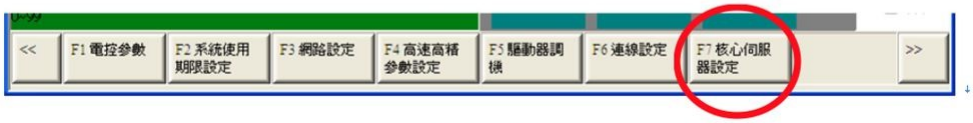
1. F6 Parameter Setting → F10 Next Page → F7 Core Server (Fig. 3).
2. F5 Maintenance → F2 Network Settings → F5 Core Server



(圖三 a)

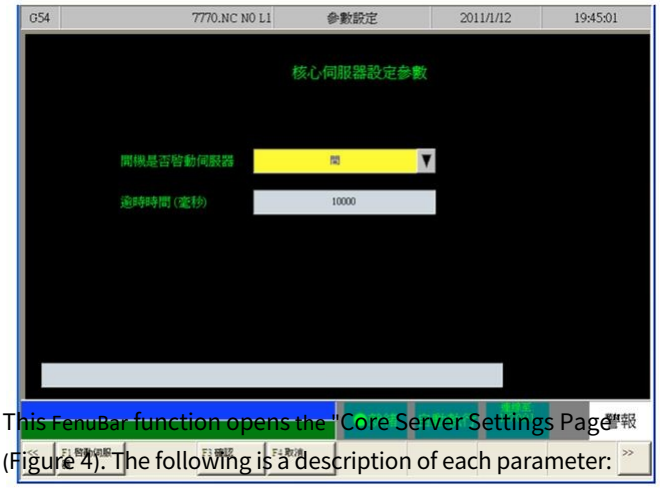


(圖三 b)



(圖三 c)

Use the panel to modify the Dipole settings:



This FenuBar function opens the "Core Server Settings Page" (Figure 4). The following is a description of each parameter:

- "Whether or not to start the server at power on" is whether or not to automatically start the core's Dipole function at power on.
- "Timeout Time" is the time after which the network does not respond and the network connection is disconnected.

After users finish the setting of core Dipole, they can press "F3 Confirm" to save the setting value, or press "F4 Cancel" to restore the setting value. After setting, the Dipole function will be activated automatically next time when power on.

2 Project Settings

- Please refer to the attached example SyntecRemoteExample and change the project reference Syntec.RemoteCNC.dll (after version 1.2.0 (inclusive) to reference Syntec.OpenCNC.dll).

2.1 Precautions before use

1. Please check the controller version first and check the table below to find the corresponding RemoteAPI version.
2. If you are using RemoteAPI v1, please install MacroDev, the same version of 32 emulation software as the controller.
3. Syntec.OpenCNC.dll, Syntec.RemoteCNC.dll, Syntec.RemoteObj.dll, OCAPI.dll, OCUSER.dll ... etc. must be placed in the same folder as the main application.

2.2 Troubleshooting FAQs

1. The computer firewall needs to be enabled on port 5568, port 5570 for the controller to be connected to the computer.
   " Windows environments can be found at Firewall> Advanced Settings> Enter Rule> Add Rule> Ports> TCP > Enter 5568,5570
   > Allow All Connections "
2. Note that computers with two NICs need to have the priority of the NIC that connects to the controller set higher in order to connect properly.
   "Windows environment can be found in the Networking and Sharing Centre> Access to change card settings> Pressing F10 will bring up the toolbar> Advanced> Advanced Settings> Adjust the network settings for the card in the connection place "
3. When using v4 version, if you find that the network is unstable and sends back error messages, please reconnect after 10 seconds.
4. Using 1.0.12_v1, found that there are missing Syntec.RemoteCNC.dll and Syntec.RemoteObj.dll, please go to the official website to re-grab 1.0.12_v1.
5. If you can't compile with 1.2.0, please change reference Syntec.OpenCNC.dll.

Note: If there is any error in the above Windows operation, please find the relevant settings by yourself.

2.3 RemoteAPI Version Comparison Table

Controller Version	RemoteAPI Version	note
10.116.54.x later	1.2.1 Later	Remove restrictions on the use of new versions of controllers
10.116.36.x	1.0.12_v4	
10.116.24.x	1.0.12_v3	
10.116.10.x~ 10.116.16.x	1.0.12_v2	
10.116.0.x	1.0.12_v1	Requires installation of MarcoDev

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n to
Functions

3 Setting the base model & Returning errors

data format

Type Name	space occupied
byte	8-bit
short	16-bit
int	32-bit (computing)
float	32-bit (computing)
string	not limited to

Return error description

return value (short)	**error category**	**instructions**
-18	Not supported	The controller does not support this function.
-17	Protocol error (Ethernet version only)	Data from Ethernet Board is incorrect.Contact with the service section or the section in charge.
-16	Socket error (Ethernet version only)	Investigate CNC power supply, Ethernet cable and I/F board.
-15	DLL file error	There is no DLL file for each CNC series corresponding to specified node.
-14	USBEmpty	USB is empty
-13	NoUSB	No USB is pulgin

return value (short)	error category	instructions
-8	Handle number error	Get the library handle number.
-7	Version mismatch between the CNC/PMC and library	The CNC/PMC version does not match that of the library.Replace the library or the CNC/PMC control software.
-6	Abnormal library state	An unanticipated error occurred.Contact with the section in charge.
-2	Reset or stop request	The RESET or STOP button was pressed.Call the termination function.
-1	CNC Busy	Wait until the completion of CNC processing, or retry.
0	**Normal termination**	**Complete the assignment without errors!**
1	Error(function is not executed, or not available)	Specific function which must be executed beforehand has not been executed.Otherwise that function is not available.
2	Error(data block length error, error of number of data)	Check and correct the data block length or number of data.
3	Error(data number error)	Check and correct the data number.
4	Error(data attribute error)	Check and correct the data attribute.
5	Error(data error)	Check and correct the data.
6	Error (no option)	There is no corresponding CNC option.
7	Error(write protection)	Write operation is prohibited.
8	Error(memory overflow)	CNC tape memory is overflowed.
9	Error(CNC parameter error)	CNC parameter is set incorrectly.

return value (short)	error category	instructions
10	Error(buffer empty/full)	The buffer is empty or full.
11	Error(path number error)	A path number is incorrect.
12	Error(CNC mode error)	The CNC mode is incorrect.
13	Error(CNC execution rejection)	The execution at the CNC is rejected.Check the condition of execution.
14	Error (Data server error)	Some errors occur at the data server.
15	Error(alarm)	The function cannot be executed due to an alarm in CNC.Remove the cause of alarm.
16	Error(stop)	CNC status is stop or emergency.
17	Error (State of data protection)	Data is protected by the CNC data protection function.
18	Error(Not found Machine ID)	Please Check or not send CNC_CONNECTION command.
19	Error (No out)	Please Check NO.
20	Error(Need to Update RemoteCnc Version)	RemoteAPI version is too old for connected controller, need to update RemoteAPI version.

4 basic category

isUSBExist ： Whether there is

Name of the function	bool isUSBExist( )			
citation	Variable name	type (e.g. blood type)	[in/out]	instructions
return value				

SeriesNo: Controller serial number

Name of the function	short GetSeriesNo(...)		
citation	Variable name	type (e.g. blood type)	[in/out]	instructions
	szSeriesNo	string	out	Controller serial number or empty string
return value	0:Complete the assignment, otherwise refer to 3-2 Return Error Description		

CncOption: Controller software option

Name of the function	short GetCncOption(...)

citation	<table><tr><th>Variable name</th><th>type (e.g. blood type)</th><th>[in/out]</th><th>instructions</th></tr><tr><td>szCncOption</td><td>string</td><td>out</td><td>Software options for the controller (separated by spaces)</td></tr></table>
return value	0:Complete the assignment, otherwise refer to 3-2 Return Error Description

MainBoardPlatformName: Controller main board model number

Name of the function	short GetMainBoardPlatformName(...)
citation	<table><tr><th>Variable name</th><th>type (e.g. blood type)</th><th>[in/out]</th><th>instructions</th></tr><tr><td>szName</td><td>string</td><td>out</td><td>Controller motherboard model number or empty string</td></tr></table>
return value	0:Complete the assignment, otherwise refer to 3-2 Return Error Description

READ_information: basic related

Name of the function	short READ_information(...)

citation	

Variable name	type (e.g. blood type)	[in/out]	instructions
Axes	short	out	Number of controllable axes
CncType	string	out	ex :'18' : Series 180/180i
MaxAxes	short	out	Maximum number of axes
Series	string	out	M/T type
Nc_Ver	string	out	NC Version
AxisName	string[]	out	Coordinate name of each axis

return value	0:Complete the assignment, otherwise refer to 3-2 Return Error Description

READ_status: status

Name of the function	short READ_status(...)

<table>
<tr><td>citation</td><td>
<table>
<tr><td>Variable name</td><td>type (e.g. blood type)</td><td>[in/out]</td><td>instructions</td></tr>
<tr><td>MainProg</td><td>string</td><td>out</td><td>master program filename</td></tr>
<tr><td>CurProg</td><td>string</td><td>out</td><td>Current implementation slot</td></tr>
<tr><td>CurSeq</td><td>x</td><td>out</td><td>No support, preset -1</td></tr>
<tr><td>Mode</td><td>string</td><td>out</td><td>ex: "MDI", "MEM"...</td></tr>
<tr><td>Status</td><td>string</td><td>out</td><td>ex: "STOP", "START"...</td></tr>
<tr><td>Alarm</td><td>string</td><td>out</td><td>ex: "ALARM", "****"</td></tr>
<tr><td>EMG</td><td>string</td><td>out</td><td>ex: "EMG", "****"</td></tr>
</table>
</td></tr>
<tr><td>return value</td><td>0:Complete the assignment, otherwise refer to 3-2 Return Error Description</td></tr>
<tr><td>note</td><td>Alarm: when there is an Alarm occurrence, return "ALARM"; when there is no Alarm occurrence, return "****" EMG: when there is an EMERGENCE STOP occurrence, return "EMG"; when there is no EMERGENCE
STOP occurs by echoing "****"</td></tr>
</table>

READ_position: coordinate information

Name of the function	short READ_position(...)

citation	
return value	

Variable name	type (e.g. blood type)	[in/out]	instructions
AxisName	string[]	out	Coordinate name of each axis
DecPoint	short	out	number of decimal places
Unit	string[]	out	coordinate unit
Mach	float[]	out	mechanical coordinates
Abs	float[]	out	absolute coordinates (geometry)
Rel	float[]	out	relative coordinates (geometry)
Dist	float[]	out	remaining distance

WRITE_relpos: sets the relative coordinate value.

Name of the function	short WRITE_relpos(...)
citation	
return value	

Variable name	type (e.g. blood type)	[in/out]	instructions
AxisName	string	in	Axis coordinate name
PosValue	double	in	relative coordinate value

READ_gcode: G Code

Name of the function	short READ_gcode(...)
citation	Variable name: Gdata; type (e.g. blood type): string[]; [in/out]: out; instructions: G Code
return value	0:Complete the assignment, otherwise refer to 3-2 Return Error Description

READ_othercode: Other Code (H Code, D Code, T Code, M Code, B Code, F Code, S Code)

Name of the function	short READ_othercode(...)
citation	Variable name / type (e.g. blood type) / [in/out] / instructions: HCode / int / out / H Code DCode / int / out / D Code TCode / int / out / T Code MCode / int / out / M Code FCode / int / out / F Code SCode / int / out / S Code
return value	0:Complete the assignment, otherwise refer to 3-2 Return Error Description

READ_spindle: Feed rate / RPM

Name of the function	short READ_spindle(...)
citation	

Variable name	type (e.g. blood type)	[in/out]	instructions
OvFeed	float	out	Feed Rate Over Ride
OvSpindle	float	out	Spindle Over Ride
ActFeed	float	out	Actual feed rate
ActSpindle	int	out	Actual spindle speed

return value	0:Complete the assignment, otherwise refer to 3-2 Return Error Description

READ_time: time

Name of the function	short READ_time(...)
citation	

Variable name	type (e.g. blood type)	[in/out]	instructions
PowerOnTime	int	out	Switch-on time (sec)
AccumulateCuttingTi me	int	out	Cutting time (sec)
CuttingTimePerCycle	int	out	CYCLE time (sec)
WorkTime	int	out	Processing time (sec)

return value	

READ_part_count: number of artefacts

Name of the function	short READ_part_count(...)
citation	
return value	

Variable name	type (e.g. blood type)	[in/out]	instructions
part_count	int	out	Number of workpieces
require_part_count	Int	out	Number of workpieces required
Total_part_count	int	out	Total number of workpieces

DOWNLOAD_work_record: Download remote processing record file

Name of the function	short DOWNLOAD_work_record (...)
citation	
return value	0:Complete the assignment, otherwise refer to 3-2 Return Error Description

Variable name	type (e.g. blood type)	[in/out]	instructions
Destination	string	in	Download Destination Path

IsDipoleSupported: whether the dipole can be passed within the given timeout period.

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Name of the function	bool IsDipoleSupported (...)

citation	Variable name / type (e.g. blood type) / [in/out] / instructions IPAddr / string / in / Destination IP address Timeout / uint / in / Specified timeout time (milliseconds)
return value	0:Complete the assignment, otherwise refer to 3-2 Return Error Description

READ_MakerConfigInfo: get machine shop

Name of the function	short READ_MakerConfigInfo(...)
citation	Variable name / type (e.g. blood type) / [in/out] / instructions szModel / string / out / Machine Model szMachSN / string / out / Machine serial number szDate / string / out / Machine factory date szDevSN / string / out / Electronic control serial number szPhone / string / out / Machine shop phone
return value	

WRITE_MakerConfigInfo: Setting machine shop

Name of the function	short WRITE_MakerConfigInfo(...)

citation	Variable name	type (e.g. blood type)	[in/out]	instructions
	szModel	string	in	Machine Model
	szMachSN	string	in	Machine serial number
	szDate	string	in	Machine factory date
	szDevSN	string	in	Electronic control serial number
return value	szPhone	string	in	Machine shop phone

5 Alarm Type Function

READ_alm_current: alarms currently occurring

Name of the function	short READ_alm_current(...)
citation	

Variable name	type (e.g. blood type)	[in/out]	instructions
IsAlarm	bool	out	Determine if there is an alarm
AlmMsg	String[]	out	Get current alarm messages
AlmTime	DateTime[]	out	Get the time of the alarm that is currently occurring

return value	0:Complete the assignment, otherwise refer to 3-2 Return Error Description
note	The way the alarm arrays are discharged, from new to old. Alarm message format ("Category (Motion)" "Number" "Description")

READ_alm_history: alert history

Name of the function	short READ_alm_history(...)
citation	

Variable name	type (e.g. blood type)	[in/out]	instructions
AlmMsg	string[]	out	Alarm messages
AlmTime	DateTime[]	out	Alarm time and date

return value	0:Complete the assignment, otherwise refer to 3-2 Return Error Description

note	The way the alarm arrays are discharged, from new to old. Alarm message format ("Category (Motion)" "Number" "Description")
Name of the function	short READ_alm_history(...)
citation	

Variable name	type (e.g. blood type)	[in/out]	instructions
AlmMsg	string[]	out	Alarm messages
AlmTime	DateTime[]	out	Alarm time and date
Duration	uint[]	out	Experience time in s seconds
Clear	bool[]	out	Whether or not it has been lifted

return value	0:Complete the assignment, otherwise refer to 3-2 Return Error Description
note	• **Only support 10.116.54Q, 10.118.0K, 10.118.11 and above.** • The way the alarm arrays are discharged, from new to old. • Alarm message format ("Category (Motion)" "Number" "Description")

6 Tool Completion Category Function

READ_offset_title: get the title column of the tool Offset

Name of the function	short READ_offset_title(...)
citation	Variable name | type (e.g. blood type) | [in/out] | instructions OffsetTitle | string[] | out | title bar
return value	0:Complete the assignment, otherwise refer to 3-2 Return Error Description
note	range | Return Value Description | models Syntec M Series | {"radius geom", "radius wear", "lenght geom", "lenght wear"} | Mill, Drill, Wood, GlassGrind Syntec T Series | { "wear x", "wear z", "wear a", "length x", "length y", "length a", "tool nose radius", "tool nose r wear", "tool nose"} | Lathe

READ_offset_all: Get all the tool offsets.

Name of the function	short READ_offset_all(...)
citation	Variable name | type (e.g. blood type) | [in/out] | instructions OffsetData | double[][] | out | supplementary information
return value	

note	OffsetData second array to match the title name (Length Geom...). The information is obtained starting from cutter No. 1.

READ_offset_scope: Get the tool offset according to the specified scope.

Name of the function	short READ_offset_scope(...)
citation	
return value	0:Complete the assignment, otherwise refer to 3-2 Return Error Description

Variable name	type (e.g. blood type)	[in/out]	instructions
StartNumber	short	in	Starting number (from 1)
EndNumber	short	in	Termination Number
OffsetData	double[][]	out	supplementary information

READ_offset_single: Get single tool offset

Name of the function	short READ_offset_single(...)
citation	
return value	0:Complete the assignment, otherwise refer to 3-2 Return Error Description

Variable name	type (e.g. blood type)	[in/out]	instructions
ofNumber	short	in	Setting the correction number
OffsetData	double[]	out	supplementary information

WRITE_offset_all: Write All Tool Offset

Name of the function	short WRITE_offset_all(...)
citation	Variable name / type (e.g. blood type) / [in/out] / instructions OffsetData / double[][] / in / Setting up supplementary information
return value	
note	Write from the 1st knife until the end of OffsetData.

WRITE_offset_single: Write Single Tool Offset

Name of the function	short WRITE_offset_single(...)
citation	Variable name / type (e.g. blood type) / [in/out] / instructions ofNumber / short / in / Setting the correction number OffsetData / double[] / in / Setting up supplementary information
return value	0:Complete the assignment, otherwise refer to 3-2 Return Error Description

READ_offset_count: Get the number of tool offset strokes

Name of the function	short READ_offset_count(...)

<table>
<tr><td>citation</td><td><table>
<tr><td>Variable name</td><td>type (e.g. blood type)</td><td>[in/out]</td><td>instructions</td></tr>
<tr><td>Count</td><td>short</td><td>out</td><td>Number of corrections</td></tr>
</table></td></tr>
<tr><td>return value</td><td>0:Complete the assignment, otherwise refer to 3-2 Return Error Description</td></tr>
</table>

7 Type of workpiece coordinates

READ_work_coord_axis: get the title name of the workpiece coordinates

Name of the function	short READ_work_coord_title(...)
citation	Variable name: WorkCoordTitle; type (e.g. blood type): string[]; [in/out]: out; instructions: Title Name
return value	0:Complete the assignment, otherwise refer to 3-2 Return Error Description

READ_work_coord_all: Get all the work coordinate information.

Name of the function	short READ_work_coord_all(...)
citation	Variable name: CoordName; type (e.g. blood type): string[]; [in/out]: out; instructions: term (in a mathematical formula) ex:EXT,G54,G55 ... Variable name: WorkCoord; type (e.g. blood type): float[][]; [in/out]: out; instructions: Workpiece coordinate data
return value	0:Complete the assignment, otherwise refer to 3-2 Return Error Description
note	CoordName items such as. EXT,MPGShift, G54, G55, G56, G57, G58, G59 , G54P7, G54P8, G54P100 and so on.

READ_work_coord_scope: Get the coordinate data of the workpiece according to the specified range.

Name of the function	short READ_work_coord_scope(...)

<table>
<tr><td>citation</td><td>
<table>
<tr><td>Variable name</td><td>type (e.g. blood type)</td><td>[in/out]</td><td>instructions</td></tr>
<tr><td>StartNumber</td><td>short</td><td>in</td><td>Starting number</td></tr>
<tr><td>EndNumber</td><td>short</td><td>in</td><td>Termination Number</td></tr>
<tr><td>CoordName</td><td>string[]</td><td>out</td><td>term (in a mathematical formula)
ex:EXT,G54,G55 ...</td></tr>
<tr><td>WorkCoord</td><td>float[][]</td><td>out</td><td>Workpiece coordinate data</td></tr>
</table>
</td></tr>
<tr><td>return value</td><td>0:Complete the assignment, otherwise refer to 3-2 Return Error Description</td></tr>
<tr><td>note</td><td>CoordName items such as.
EXT,MPGShift, G54, G55, G56, G57, G58, G59 , G54P7, G54P8, G54P100 and so on.
The following ranges correspond to the coordinate names of the workpiece
<table>
<tr><td>Name of workpiece</td><td>corresponding number</td></tr>
<tr><td>EXT</td><td>0</td></tr>
<tr><td>MPG Shift</td><td>1</td></tr>
<tr><td>G54</td><td>2</td></tr>
<tr><td>G55</td><td>3</td></tr>
<tr><td>G56</td><td>4</td></tr>
<tr><td>G57</td><td>5</td></tr>
<tr><td>G58</td><td>6</td></tr>
<tr><td>G59</td><td>7</td></tr>
<tr><td>G54 P7~P100</td><td>8~101</td></tr>
</table>
</td></tr>
</table>

READ_work_coord_single: get single work coordinate information

Name of the function	short READ_work_coord_single(...)
citation	

Variable name	type (e.g. blood type)	[in/out]	instructions
CoordName	string	in	term (in a mathematical formula) ex:EXT,G54,G55 ...
WorkCoord	float[]	out	Workpiece coordinate data

return value	0:Complete the assignment, otherwise refer to 3-2 Return Error Description

WRITE_work_coord_all: Write all work coordinate data

Name of the function	short WRITE_work_coord_all(...)
citation	

Variable name	type (e.g. blood type)	[in/out]	instructions
CoordName	string[]	in	set item ex:EXT,G54,G55 ...
WorkCoord	float[][]	in	Setting of workpiece coordinate data

return value	0:Complete the assignment, otherwise refer to 3-2 Return Error Description

WRITE_work_coord_single: write single work coordinate information

Name of the function	short WRITE_work_coord_single(...)

citation	<table><tr><th>Variable name</th><th>type (e.g. blood type)</th><th>[in/out]</th><th>instructions</th></tr><tr><td>CoordName</td><td>string</td><td>in</td><td>set item ex:EXT,G54,G55 ...</td></tr><tr><td>WorkCoord</td><td>float[]</td><td>in</td><td>Setting of workpiece coordinate data</td></tr></table>
return value	0:Complete the assignment, otherwise refer to 3-2 Return Error Description

READ_work_coord_count: Get the number of work coordinate strokes

Name of the function	short READ_work_coord_count(...)
citation	<table><tr><th>Variable name</th><th>type (e.g. blood type)</th><th>[in/out]</th><th>instructions</th></tr><tr><td>Count</td><td>short</td><td>out</td><td>Number of workpiece coordinate strokes</td></tr></table>
return value	

8 Macro Variable Category Functions (Commutative Variables)

READ_macro_all: Get information about all Macro variables (common variables).

Name of the function	short READ_macro_all(...)
citation	Variable name / type (e.g. blood type) / [in/out] / instructions MacroNumber / int[] / out / Macro number MacroData / double[] / out / Information on Macro variables
return value	0:Complete the assignment, otherwise refer to 3-2 Return Error Description

READ_macro_scope: Get Macro (common variable) variable information according to the specified scope.

Name of the function	short READ_macro_scope(...)
citation	Variable name / type (e.g. blood type) / [in/out] / instructions StartNumber / int / in / Starting number (from 1) EndNumber / int / in / Termination Number MacroNumber / int[] / out / Macro number MacroData / double[] / out / Information on Macro variables
return value	0:Complete the assignment, otherwise refer to 3-2 Return Error Description

WRITE_macro_all: Write information about all Macro variables (common variables)

Name of the function	short WRITE_macro_all(...)
citation	Variable name / type (e.g. blood type) / [in/out] / instructions MacroNumber / int[] / in / Setting the Macro Number MacroData / double[] / in / Setting Macro Variable Information
return value	0:Complete the assignment, otherwise refer to 3-2 Return Error Description

READ_macro_single: Get information about a single Macro variable (common variable).

Name of the function	short READ_macro_single(...)
citation	Variable name / type (e.g. blood type) / [in/out] / instructions MacroNumber / int / in / Macro number MacroData / double / out / Information on Macro variables
return value	0:Complete the assignment, otherwise refer to 3-2 Return Error Description

WRITE_macro_single: Write single Macro variable (common variable) information

Name of the function	short WRITE_macro_single(...)

citation	Variable name / type (e.g. blood type) / [in/out] / instructions MacroNumber / int / in / Setting the Macro Number MacroData / double / in / Setting Macro Variable Information
return value	0:Complete the assignment, otherwise refer to 3-2 Return Error Description

READ_macro_variable: Get the start and end number of the macro variable (common variable).

Name of the function	short READ_macro_variable(...)
citation	Variable name / type (e.g. blood type) / [in/out] / instructions Variable / int[][] / out / Macro variable start and end numbers
return value	0:Complete the assignment, otherwise refer to 3-2 Return Error Description
note	Array declaration: Variable[type][0]:Start Number Variable[type][1]:End Number As: Variable[0][0]:100 Variable[0][1]:199 Variable[1][0]:500 Variable[1][1]:599

9 Machining programme type function

WRITE_nc_main: Specify the processing procedure

Name of the function	short WRITE_nc_main(...)
Lead type 1	**Variable name** / **type (e.g. blood type)** / **[in/out]** / **instructions** szProgName / string / in / Machining programme name
Lead type 2	**Variable name** / **type (e.g. blood type)** / **[in/out]** / **instructions** szProgName / int / in / Machining programme name nCoordID / int / in / Axis Group Number nLineNumber / int / in / starting line number
return value	
note	• Backend controller support version: 10.116.10x or above • Backend controller boards 10.116.10x-10.116.16x After specifying the machining programme, the controller mode cannot be changed. • The API for Quotient Type 2 is 10.116.54A after the Syntec.RemoteCNC.Win32.dll only provided • When using Lead Type 2, refer to this document Multi-Axis Cluster Planning and MST Multi-Channel Applications Manual

READ_nc_mem_list: Get the list of internal machining programmes of the machine.

Name of the function	short READ_nc_mem_list(...)

citation	<table><tr><th>Variable name</th><th>type (e.g. blood type)</th><th>[in/out]</th><th>instructions</th></tr><tr><td>NcList</td><td>string[][]</td><td>out</td><td>Machining programme list</td></tr></table>
return value	0:Complete the assignment, otherwise refer to 3-2 Return Error Description
note	Since NC lists vary from manufacturer to manufacturer, the following format is recommended: NcList[][0]:NC Name NcList[][1]:Size (byte) NcList[][2]:Last Write DateTime NcList[][3]: file / directory Note: If there is no processing file, it will still return -1 (CNCBUSY), please note this point.

UPLOAD_nc_mem: uploads the machining

Name of the function	short UPLOAD_nc_mem(...)
citation	<table><tr><th>Variable name</th><th>type (e.g. blood type)</th><th>[in/out]</th><th>instructions</th></tr><tr><td>Source</td><td>string</td><td>in</td><td>Local full path name</td></tr></table>
return value	0:Complete the assignment, otherwise refer to 3-2 Return Error Description

DOWNLOAD_nc_mem: Download machining

Name of the function	short UPLOAD_nc_mem(...)

citation	Variable name | type (e.g. blood type) | [in/out] | instructions Source | string | in | Name of NC file Destination | string | in | Local folder path
return value	0:Complete the assignment, otherwise refer to 3-2 Return Error Description

DEL_nc_mem: deletes the machining programme in the controller

Name of the function	short DEL_nc_mem(...)
citation	Variable name | type (e.g. blood type) | [in/out] | instructions Name | string | in | name (of a thing)
return value	

READ_nc_freespace: remaining space capacity (k)

Name of the function	short READ_nc_freespace(...)
citation	Variable name | type (e.g. blood type) | [in/out] | instructions FreeSpace | Long | out | Remaining space capacity (k)
return value	0:Completion of the assignment, please refer to Annex I for other return error descriptions

READ_nc_OPLog: get operation logs

<table>
<tr><td>Name of the function</td><td>short READ_nc_OPLog(...)</td></tr>
<tr><td>citation</td><td>
<table>
<tr><th>Variable name</th><th>type (e.g. blood type)</th><th>[in/out]</th><th>instructions</th></tr>
<tr><td>OPLog</td><td>string[]</td><td>out</td><td>Operation Record</td></tr>
<tr><td>count</td><td>int</td><td>in/out</td><td>log ratio</td></tr>
</table>
</td></tr>
<tr><td>return value</td><td>0:Completion of the assignment, otherwise please refer to Annex I for a description of the return error</td></tr>
<tr><td>note</td><td>1. count passes in the ratio to be read and passes back the ratio to be read.
2. Passing in a parameter count of 0 returns all operation records.
3. A timeout error occurs, use the SynetcRemoteCNC(ip,timeout) constructor to adjust the timeout up, timeout=0 for none, timeout is in ms.
4. The OPLog returned can be referred to the appendix for the relevant information

Note: If there is no Log, it still returns the original array and writes "No Log"</td></tr>
</table>

10 System Parameter Category Functions

READ_param_max: Get the maximum number of machine parameter

Name of the function	short READ_param_max(...)
citation	Variable name: MaxNumber; type (e.g. blood type): int; [in/out]: out; instructions: Maximum number of parameters
return value	

READ_param_schema: Get all the parameter information.

Name of the function	short READ_param_schema(...)
citation	Variable name: index; type (e.g. blood type): int[]; [in/out]: out; instructions: parameter number Variable name: value; type (e.g. blood type): int[]; [in/out]: out; instructions: parameter value Variable name: context; type (e.g. blood type): string[]; [in/out]: out; instructions: Parameter description Variable name: bound; type (e.g. blood type): string[]; [in/out]: out; instructions: Parameter upper and lower limits Variable name: count; type (e.g. blood type): int; [in/out]: out; instructions: Number of parameters
return value	

READ_param_data: get parameter data

Name of the function	short READ_param_data(...)
citation	

Variable name	type (e.g. blood type)	[in/out]	instructions
ParamStart	int	in	Parameter start number
ParamEnd	int	in	Parameter termination number
ParmData	int[]	out	Parametric information

return value	0:Complete the assignment, otherwise refer to 3-2 Return Error Description
note	※ ParamType is set to -1 if the specified parameter number does not exist on the controller or the acquisition fails.

WRITE_param_single: write single parameter information

Name of the function	short WRITE_param_single(...)
citation	

Variable name	type (e.g. blood type)	[in/out]	instructions
ParamID	int	in	parameter number
val	int	in	The value of the parameter to be written

return value	

11 PLC Category Functions

READ_plc_type: Get the type of PLC address.

Name of the function	short READ_plc_type(...)
citation	Variable name / type (e.g. blood type) / [in/out] / instructions Addr / string / in / ex:I,O,C,S,A,R PlcType / short / out / 0:byte 1:short 2:int
return value	0:Complete the assignment, otherwise refer to 3-2 Return Error Description

READ_plc_type2: Get the PLC address type and address size.

Name of the function	short READ_plc_type2(...)
citation	Variable name / type (e.g. blood type) / [in/out] / instructions Addr / string / in / ex:I,O,C,S,A,R PlcType / short / out / 0:byte 1:short 2:int PlcStart / int / out / address starting number PlcEnd / int / out / address ending number
return value	0:Complete the assignment, otherwise refer to 3-2 Return Error Description
note	The number of I,O depends on the I/O card selected.

READ_plc_addr: Get the PLC address information

Name of the function	short READ_plc_addr(...)
citation	

Variable name	type (e.g. blood type)	[in/out]	instructions
Addr	string	in	ex:I,O,C,S,A,R
PlcStart	int	in	address starting value
PlcEnd	int	in	address termination value
PlcType	short	out	0:byte 1:short 2:int
PlcDataB	byte[]	out	Plc information (byte)
PlcDataS	short[]	out	Plc information (short)
PlcDataI	int[]	out	Plc Information (int)

return value	0:Complete the assignment, otherwise refer to 3-2 Return Error Description
note	The obtained value will be put into the array of PlcData(B,S,I), if the number failed to be obtained, the array value will be set to null.

WRITE_plc_addr: Write PLC address

Name of the function	short WRITE_plc_addr(...)

citation	<table><tr><th>Variable name</th><th>type (e.g. blood type)</th><th>[in/out]</th><th>instructions</th></tr><tr><td>Addr</td><td>string</td><td>in</td><td>ex:I,C,S,R</td></tr><tr><td>PlcStart</td><td>int</td><td>in</td><td>address starting value</td></tr><tr><td>PlcEnd</td><td>int</td><td>in</td><td>address termination value</td></tr><tr><td>PlcType</td><td>short</td><td>in</td><td>0:byte 1:short 2:int</td></tr><tr><td>PlcDataB</td><td>byte[]</td><td>in</td><td>Plc information (byte)</td></tr><tr><td>PlcDataS</td><td>short[]</td><td>in</td><td>Plc information (short)</td></tr><tr><td>PlcDataI</td><td>int[]</td><td>in</td><td>Plc Information (int)</td></tr></table>
return value	0:Complete the assignment, otherwise refer to 3-2 Return Error Description

READ_plc_ver: PLC version

Name of the function	short READ_plc_ver(...)
citation	<table><tr><th>Variable name</th><th>type (e.g. blood type)</th><th>[in/out]</th><th>instructions</th></tr><tr><td>Version</td><td>string</td><td>out</td><td>Plc Version Information</td></tr></table>
return value	0:Complete the assignment, otherwise refer to 3-2 Return Error Description

DOWNLOAD_plc_ladder: download remote ladder file

Name of the function	short DOWNLOAD_plc_ladder (...)

citation	<table><tr><td>Variable name</td><td>type (e.g. blood type)</td><td>[in/out]</td><td>instructions</td></tr><tr><td>Destination</td><td>string</td><td>in</td><td>Download Destination Path</td></tr></table>
return value	0:Complete the assignment, otherwise refer to 3-2 Return Error Description

READ_plc_ibit: get PLC I Bit address data

READ_plc_obit: get PLC O Bit address data

READ_plc_cbit: get PLC C Bit address data

READ_plc_sbit: get PLC S Bit address data

READ_plc_abit: get PLC A Bit address data

Bit address information

Name of the function	short READ_plc_ibit(...) short READ_plc_obit(...) short READ_plc_cbit(...) short READ_plc_sbit(...) short READ_plc_cbit(...) short READ_plc_sbit(...) short READ_plc_abit(...) ...) short READ_plc_abit(...)
citation	
return value	0:Complete the assignment, otherwise refer to 3-2 Return Error Description

READ_plc_register: Get PLC Register address information.

Name of the function	short READ_plc_register(...)
citation	Variable name / type (e.g. blood type) / [in/out] / instructions PlcStart / int / in / address starting value PlcEnd / int / in / address termination value PlcData / int[] / out / Plc Information (int)
return value	0:Complete the assignment, otherwise refer to 3-2 Return Error Description

READ_plc_register: Get PLC Register address string information.

Name of the function	short READ_plc_register(...)
citation	Variable name / type (e.g. blood type) / [in/out] / instructions RAddress / int / in / addresses PlcData / string / out / Plc Information(string)
return value	0:Complete the assignment, otherwise refer to 3-2 Return Error Description

READ_plc_timer: Get PLC Timer address information.

Name of the function	short READ_plc_timer(...)

citation	

Variable name	type (e.g. blood type)	[in/out]	instructions
PlcStart	int	in	address starting value
PlcEnd	int	in	address termination value
PlcTimerValue	int[]	out	Plc Timer Value
PlcTimerSetting	int[]	out	Plc Timer Setting
PlcTimerState	short[]	out	Plc Timer Status

return value	0:Complete the assignment, otherwise refer to 3-2 Return Error Description

READ_plc_counter: Get PLC Counter address information.

Name of the function	short READ_plc_timer(...)
citation	

Variable name	type (e.g. blood type)	[in/out]	instructions
PlcStart	int	in	address starting value
PlcEnd	int	in	address termination value
PlcCounterValue	int[]	out	Plc Counter Value
PlcCounterSettin g	int[]	out	Plc Counter Setting
PlcCounterState	short[]	out	Plc Counter Status

return value	0:Complete the assignment, otherwise refer to 3-2 Return Error Description

WRITE_plc_ibit: Write PLC I BIT address data WRITE_plc_cbit: Write PLC C BIT address data WRITE_plc_sbit: Write PLC S BIT address data

Name of the function	short WRITE_plc_ibit(...) short WRITE_plc_cbit(...) short WRITE_plc_sbit(...)
citation	
return value	0:Complete the assignment, otherwise refer to 3-2 Return Error Description

WRITE_plc_register: Write the PLC Register address information.

Name of the function	short WRITE_plc_register(...)
citation	
return value	0:Complete the assignment, otherwise refer to 3-2 Return Error Description

Variable name	type (e.g. blood type)	[in/out]	instructions
PlcStart	int	in	address starting value
PlcEnd	int	in	address termination value
PlcData	int[]	in	Plc Information (int)

12 system variable function (math.)

READ_state_variable: system state variable information

Name of the function	short READ_state_variable(...)
citation	
return value	

Variable name	type (e.g. blood type)	[in/out]	instructions
StateStart	int	in	address starting value
StateStart	int	in	address termination value
StateVariable	int[]	out	System status variable information

READ_debug_variable: Get system diagnostic variable information.

Name of the function	short READ_debug_variable (...)
citation	
return value	0:Complete the assignment, Otherwise refer to 3-2 Return Error Description NOTE: System diagnostic variables 77 and 78 are specific to the controller, refer to Diagnostic Variable No. 7 if system residual memory information is required.

Variable name	type (e.g. blood type)	[in/out]	instructions
DebugStart	int	in	address starting value
DebugEnd	int	in	address termination value
DebugVariable	int[]	out	Information on system diagnostic variables

READ_system_variable: Get system variable information (#)

Name of the function	short READ_system_variable (...)
citation	

Variable name	type (e.g. blood type)	[in/out]	instructions
SystemID	int	in	Axis group number
SystemStart	int	in	address starting value
SystemEnd	int	in	address termination value
DebugVariable	double[]	out	Information on system variables

return value	0:Complete the assignment, otherwise refer to 3-2 Return Error Description

READ_useTime: System use time

Name of the function	short READ_useTime (...)
citation	

Variable name	type (e.g. blood type)	[in/out]	instructions
Status	String	out	Current machine usage time status
TimeStart	String	out	Start of use
TimeExpire	String	out	Use expiry date
TimeRemain	int	out	Remaining time (hr)

return value	0:Finish the job, please refer to 3-2 Return Error Note: Supported by software version 10.116.24x or above.

Read_remoteTime : Current system time

Name of the function	short READ_remoteTime (...)
citation	Variable name / type (e.g. blood type) / [in/out] / instructions remoteTime / DateTime / out / Current machine system time
return value	0:Complete the assignment, otherwise refer to 3-2 Return Error Description

WRITE_remoteDate: Modify system date

Name of the function	short WRITE_remoteDate (...)
citation	Variable name / type (e.g. blood type) / [in/out] / instructions Year / Int / out / surname Nian Month / Int / out / moon Day / Int / out / date
return value	0:Complete the assignment, otherwise refer to 3-2 Return Error Description

WRITE_remoteTime: modify system time

Name of the function	short WRITE_remoteTime (...)

citation	
return value	

Variable name	type (e.g. blood type)	[in/out]	instructions
Hour	Int	out	surname Shi
Minute	Int	out	ingredient
Second	Int	out	unit of angle or arc equivalent one sixtieth of a degree

ClearCache: Clear all bu

Name of the function	sho
citation	N/A
return value	0:Complete the assignment, otherwise refer to 3-2 Return Error Description Note: Clear all buffers (e.g. serial number, motherboard, model, code, etc.) and call the relevant API to get the correct information.

READ_SSV_GetDeviceInfo

Name of the function	READ_SSV_GetDeviceInfo(...)

citation	<table><tr><th>Variable name</th><th>type (e.g. blood type)</th><th>[in/out]</th><th>instructions</th></tr><tr><td>nAxisId</td><td>int</td><td>in</td><td>Axis ID</td></tr><tr><td>nFunctionCode</td><td>int</td><td>in</td><td>Which information to fetch enum DevInfoFuncCode { = 0x11. SVPackSoftVer, SVPackSN, SVMotorModel, SVMotorSN, ENCSoftVer, ENCResolution, ENCSensorType, ENCSN. }</td></tr><tr><td>szInfo</td><td>string</td><td>out</td><td>numerical value of information</td></tr></table>
return value	0:Complete the assignment, otherwise refer to 3-2 Return Error Description

READ_SerialStateVar_ServiceReg

Name of the function	READ_SerialStateVar_ServiceReg(...)

citation	**Variable name** / **type (e.g. blood type)** / **[in/out]** / **instructions** nAxisType / int / in / AXIS : 0 SPLCA : 1 ROT : 2 nDeviceID / int / in / Device ID nHandle / int / out / The code for this registration is returned when the registration is successful , and the other The SerialStateVar function will use the
return value	Return Error Description

READ_SerialStateVar_ServiceUnReg

Name of the function	**Variable name** / **type (e.g. blood type)** / **[in/out]** / **instructions**
citation	nHandle / int / in / Registration code for the specified update service
return value	0:Complete the assignment, otherwise refer to 3-2 Return Error Description

Name of the function	READ_SerialStateVar_GetCapacity(...)

citation	**Variable name** / **type (e.g. blood type)** / **[in/out]** / **instructions** nHandle / int / in / Registration code for the specified update service nCapacity / int / out / How many StateVar variables are there
return value	0:Complete the assignment, otherwise refer to 3-2 Return Error Description

READ_SerialStateVar_Dump

Name of the function	READ_SerialStateVar_Dump(...)
citation	**Variable name** / **type (e.g. blood type)** / **[in/out]** / **instructions** nHandle / int / in / Registration code for the specified update service nLength / int / in / How many state-variable specifications of the data structure to be captured tStateVarSpecList / List<TSerialStateVarSpec> / out / Information structure for each state variable specification nHexFormat / int / out / Hexadecimal or 10? promotion
return value	0:Complete the assignment, otherwise refer to 3-2 Return Error Description

READ_SerialStateVar_GetValue

Name of the function	READ_SerialStateVar_GetValue(...)
citation	

Variable name	type (e.g. blood type)	[in/out]	instructions
nHandle	int	in	Registration code for the specified update service
nLength	int	in	How many state variables to catch
SerialStateVarList	List<Int32>	out	Values for each state variable
nStatus	int	out	in the end FAIL = 0, SUCCESS, BUSY, EXCEPTION.

return value	0:Complete the assignment, otherwise refer to 3-2 Return Error Description

13 Updating Controller Related Functions

UPLOAD_software : Update controller software UPLOAD_ plc_file : Update controller PLC UPLOAD_param_file :

<table>
<tr><td>Name of the function</td><td>short Update_software (...) short
Update_plc_file (...) short
Update_param_file (...)</td></tr>
<tr><td>citation</td><td>
<table>
<tr><td>Variable name</td><td>type (e.g. blood type)</td><td>[in/out]</td><td>instructions</td></tr>
<tr><td>Source</td><td>String</td><td>out</td><td>pathfile name
Software: *\package_xxxx.zip
PLC: *\cnc.lad
Parameters: *\param.dat</td></tr>
</table>
</td></tr>
<tr><td>return value</td><td>0:Complete the assignment, otherwise refer to 3-2 Return Error Description
Note: After updating, the controller must be turned on again before updating is possible</td></tr>
</table>

14 appendice

The meaning of READ_nc_OPLog.

Name	Data Type	Size	instructions
Event ID	UINT16	2-byte	Pushbuttons, alarms, PLC, time... etc. device
Event Data	UINT16	2-byte	Event values, e.g. PLC-bit values, keypad values, alarm numbers & axes occurring

Record field format

Event Name	Event ID	Event Data
StartUp	0x0002	Null
ShutDown	0x0003	Null
KeyPressed	0x0005	
Date	0x0300~0x03FF 00000011aaaaaaaaaa a:Year	Current date bbbbbbbbbbccccccccc b:Month c:Date

Event Name	Event ID	Event Data
Time	0x0400~0x04FF 00000100aaaaaaaaaa: seconds	Current time bbbbbbbbbbccccccccc b: hours c: minutes
Alarm	0xWC00~0xWCFF zz001100aaaaaaaa a: ClassID z:Alarm ID(10~11bit)	Alarm ID bbbbbbccccccccccc b: Object ID c: Alarm ID (0~9bit) Yaskawa Servo Alarms Require 12bit for Full Recording
I-bit off	0x0010	Index
I-bit on	0x0011	Index
O-bit off	0x0012	Index
O-bit on	0x0013	Index
C-bit off	0x0014	Index
C-bit on	0x0015	Index
S-bit off	0x0016	Index
S-bit on	0x0017	Index
R	0x0020	Index
P	0x0021	Index
@	0x0022	Index
L	0x0023	Index

Event Name	Event ID	Event Data
D	0x0024	Index
K	0x0025	Index
ParameterOnChange	0x0030	Param No.
WorkPieceOnChange	0x0031	WorkPieceFrame ID
ToolCompesationOnChange	0x0032	aaaaaaaabbbbcccc a: ToolNo (the first knife) b: AxisNo axial direction c: ToolCompesationType
UserOnChange	0x0033	0x0033XXXX User rights reference R5997 0009: SyntecLogIn(R5997=9) 0063: MakerLogIn(R5997=99) 0064: AdminLogIn(R5997=100) 0065: OtherLogIn(R5997=101) 03E7: LogOut(R5997=999) (Unlogged on first boot) Other: XLogIn (XXXX decimalised to X)
human-computer activation	0x1002	Null
Human organ closure	0x1003	Null
Action(undefined)	0x1004	The CRC16 value of the action name
Action	0x1005	The mapping value of LogTable