HMI Variable.

Document Information

1 **K Vairable/Nc State Table**

- K variables are state variables, read only

No.	Name	Descriptions
0	Version Number	Format: XXxxYYYyXX Version No.xx Sub-Version No.YYY Candidate No.y Sub-Candidate No.
1	Running Compound Feedrate	LIU/min, 1 LIU = 0.001 mm in SI units; 0.0001 inch in Imperial units
2	Tool Number	
3	Running Spindle Speed	RPM
4	Controller State	• This variable gives the controller status of the axis group specified by R781. • 0: Unready; 1: Ready; 2: Machining; 3: In Feedhold; 4: Block Paused; 5: In Execute Block.
5	Controller Mode	• This variable gives the controller mode of the axis group specified by R781. • 2: Auto mode; 3: MDI; 4: manual JOG; 5: INCJOG; 6: MPG; 7: Home
6	Part Count	• This variable displays the number of finished workpieces in the axis group specified by R781. • Every time Cycle Start is triggered, the controller will check whether this variable is equal to the target number of workpieces. If it is, this variable will be cleared. • This variable will be cleared every time the processing program is switched.
7	Required Part Count	• This variable displays the number of workpieces to be processed for the axis group specified by R781.
8	Cycle Time	• This variable displays the machining time of a single workpiece of the axis group specified by R781. • Unit: seconds.

9	Accumulated Machining Time	• This variable displays the cumulative machining time of the axis group specified by R781. • Unit: seconds.
10	Running Line Number	
11	Running Serial Number	
12	Decimal Places for Linear Axis	
13	Current Input Unit	0: SI units; 1: Imperial units
14	Decimal Places for Rotary Axis	
15	Cutter Radius Compensation Number D	
16	Tool Length Compensation Number H	
17	Spindle Maximum Speed Smax	
18	Feedrate Command F	LIU/min or LIU/rev, according to G94/G95 mode
19	G01 Feedrate Override	Range: -200~200
20	Spindle Speed Command	RPM
21	Spindle Speed Override	Range: 0~120
22	Accumulated Power On Time	second
23	MPG Rate	1,10,100, custom
24	Spindle Gear	Range: 0~3, 0: Neutral; 1~3: 1~3 gear
25	Current Workpiece Coordinates Number	Range: 0~40, 40 sets 1:G54; 2:G55; 3:G56; 4:G57; 5:G58; 6:G59; 7:G54 P7; …
26	Power On Time	second
27	The number of axis group in CNC system	1~4

28	Active axis group of CNC system	Binary, for Bit values below, the decimal forms and corresponding paths are: Bit0 → 1: Non Bit1 → 2: $1 Bit2 → 4: $2 Bit3 → 8: $3 Bit4 → 16: $4
29	Active number of high precision high speed parameter	Multiple HSHP parameter sets, current applying set N (N=0~9). Set 0 is the built-in set after system reset, which is the parameter setting value
30	G00 Feedrate Override	F0, 25, 50, 100 It will be selecting F0 when the return value from kernel is 9999
31	Serial Number of 1st Path	
32	Line Number of 1st Path	
33	Serial Number of 2nd Path	
34	Line Number of 2nd Path	
35	Serial Number of 3rd Path	
36	Line Number of 3rd Path	
37	Serial Number of 4th Path	
38	Line Number of 4th Path	
39	Accumulated Cycle Start Time during machining	• This variable displays the cumulative single piece machining time of the axis group specified by R781. • Every time Cycle Start is triggered, the controller will check whether the number of workpieces (K6) is equal to the number of target workpieces. If it is, this variable will be cleared. • This variable will be cleared every time the processing program is switched. • Unit: seconds.

40	Accumulated Cycle Start Time during last machining	- This variable displays the machining time of the previous single piece for the axis group specified by R781. - When the user logs out as a staff, the controller will record the current cumulative single piece processing time (K39) to this variable. - Every time Cycle Start is triggered, the controller will check whether the number of workpieces (K6) is equal to the number of target workpieces. If it is, this variable will be cleared. - This variable will be cleared every time the processing program is switched. - Unit: seconds.
41	Accumulated Power On Time of the day	- Cumulative boot time of the day. - Unit: seconds.
42	Accumulated Machining Time of the day	- This variable displays the sum of the machining time of the axis group specified by R781 on the day. - Unit: seconds.
43	Accumulated Alarmed Time of the day	- This variable displays the sum of the time that there is an alarm for the axis group specified by R781 on that day. - Unit: seconds.
44	Accumulated Power On Time of previous day	- Cumulative boot time of yesterday. - Unit: seconds.
45	Accumulated Machining Time of previous day	- This variable displays the sum of the time of each machining of the axis group specified by R781 on the previous day. - Unit: seconds.
46	Accumulated Alarmed Time of previous day	- This variable displays the sum of the time that alarms existed yesterday for the axis group specified by R781. - Unit: seconds.

47	Part Count from Previous Machining	• This variable displays the number of workpieces processed last time for the axis group specified by R781. • When the user logs out as a staff member, the controller will record the number of currently completed workpieces (K6) to this variable. • Every time Cycle Start is triggered, the controller will check whether the number of workpieces (K6) is equal to the number of target workpieces. If it is, this variable will be cleared. • This variable will be cleared every time the processing program is switched.
50	Tool List Accessing Method	0：single axis; 1：multiple axis
51	Guidance remain distance	LIU
52	Guidance remain distance in x-direction	LIU
53	Guidance remain distance in y-direction	LIU
54	Whether Syntec drive supports unpackaged motor parameter return	0: No Syntec Drive 1: With Syntec Drive and supports unpackaged motor parameter return 2: With Syntec Drive but not supporting unpackaged motor parameter return
55	flag for Syntec unpackaged motor	0: no Syntec unpackaged motor; 1: connected with Syntec unpackaged motor
56	System Alarm	• This variable is used to display whether an alarm occurs in the axis group specified by R781. • When the axis group has an alarm, the value of this variable will be 1; when the axis group has no alarm, the value of this variable will be 0. • When R781 is set to 1, if there are system-level alarms (ROT, SPLCA, SRI, LaserCtrl), the value of this variable will also be 1.
57	PLC Alarm	This flag will be ON when there's a PLC alarm; OFF when the alarms are solved. The first 16 bits of R40~R49 (R4x.0~R4x.15) are PLC alarm messages, the PLC warning message after the 16 bits won't trigger K57.

58	System Warning	• This variable is used to display whether a warning occurs in the axis group specified by R781. • When the axis group has a warning, the value of this variable will be 1; when the axis group has no warning, the value of this variable will be 0.
59	PLC Warning	This flag will be ON when there's a PLC warning; OFF when the warnings are dismissed.
61	Interpolation Mode of current machining process	
62	Block Feedrate Command (F code) while interpolation	For non-ROBOT system, unit: LIU/min or LIU/rev; for ROBOT system, unit: mm/s or %
63	Cycle Start Date - Year	• This variable gives the year in which last time Cycle Start was triggered on the axis group specified by R781. • If Cycle Start has never been triggered, this variable gives the year in which the system was booted. • Effective only in AUTO mode.
64	Cycle Start Date - Month	• This variable gives the month in which last time Cycle Start was triggered on the axis group specified by R781.. • If Cycle Start has never been triggered, this variable gives the month in which the system was booted. • Effective only in AUTO mode.
65	Cycle Start Date - Day	• This variable gives the day on which last time Cycle Start was triggered on the axis group specified by R781. • If Cycle Start has never been triggered, this variable gives the day on which the system was booted. • Effective only in AUTO mode.
66	Cycle Start Time	• This variable gives the time at which last time Cycle Start was triggered on the axis group specified by R781. • The format is the elapsed second since 00:00:00 that day. • If Cycle Start has never been triggered, this variable gives the time at which the system was booted. • Effective only in AUTO mode.

71	Interpolation Mode, G00/G01/G02/G33/G34/G35	• This variable shows the interpolation mode of the axis group specified by R781. • If the current interpolation mode is G00, this variable is 0; if the current interpolation mode is G01, this variable is 1, and so on.
72	Working Plane Mode, G17/G18/G19	• This variable displays the work plane mode of the axis group specified by R781. • If the current working plane mode is G17, this variable is 17; if the current working plane mode is G18, this variable is 18, and so on.
73	Absolute/Relative Input Command Mode, G90/G91	• This variable shows the command mode of the axis group specified by R781. • If the current command mode is G90, this variable is 90; if the current command mode is G91, this variable is 91.
74	Second Stroke Mode, G22/G23	• This variable displays the second stroke mode of the axis group specified by R781. • If the current second travel mode is G22, this variable is 22; if the current second travel mode is G23, this variable is 23.
75	Feedrate Mode, G94/G95	• This variable displays the feed rate mode of the axis group specified by R781. • If the current feed rate mode is G94, this variable is 94; if the current feed rate mode is G95, this variable is 95.
76	SI/Imperial Units Input Dimension Mode, G70/G71	• This variable displays the metric and inch mode of the axis group specified by R781. • If the current metric and inch system mode is G70, this variable is 70; if the current metric and inch system mode is G01, this variable is 71.
77	Cutter Radius Compensation Mode, G40/G41/G42	• This variable displays the tool radius compensation mode of the axis group specified by R781. • If the current compensation mode is G40, this variable is 40; if the current compensation mode is G41, this variable is 41, and so on.
78	Tool Length Compensation Mode, G43/G44/G49	• This variable displays the tool length compensation mode of the axis group specified by R781. • If the current compensation mode is G43, this variable is 43; if the current compensation mode is G44, this variable is 44, and so on.

79	Scaling Mode, G50/G51	• This variable shows the zoom mode of the axis group specified by R781. • If the current mode is G50, this variable is 50; if the current mode is G51, this variable is 51.
80	Constant Surface Speed Cutting Mode, G96/G97	• This variable displays the constant surface speed cutting mode of the axis group specified by R781. • If the current mode is G96, this variable is 96; if the current mode is G97, this variable is 97.
81	Feed Control Mode, G61/G62/G63/G64	• This variable displays the feed rate control mode of the axis group specified by R781. • If the current mode is G61, this variable is 61; if the current mode is G62, this variable is 62, and so on.
82	Coordinate Rotation mode, G68/G69	• This variable displays the rotation mode of the axis group specified by R781. • If the current mode is G68, this variable is 68; if the current mode is G69, this variable is 69.
83	Spindle Speed Checkup Mode, G25/G26	• This variable displays the spindle speed check mode of the axis group designated by R781. • If the current inspection mode is G25, this variable is 25; if the current inspection mode is G26, this variable is 26.
84	Polar Coordinates Interpolation Mode, G12/G13	• This variable displays the polar coordinate difference mode of the axis group specified by R781. • If the current mode is G12, this variable is 12; if the current mode is G13, this variable is 13.
85	Polar Coordinates Command Mode, G15/G16	• This variable displays the polar coordinate command mode of the axis group specified by R781. • If the current polar coordinate command mode is G15, this variable is 15; if the current polar coordinate command mode is G16, this variable is 16.
100	IO Support Function	Bit 0：Support Restoring IOMap_Customer.xml Bit 1：Support Single IOMap Note: 1. This variable gives 0 when the I/O function is disabled (Pr5 is set to 9). 2. This variable is supported in 10.118.23W, 10.118.28J, 10.118.35, and later.

101~120	Current Machine Coordinate Position	
121~140	Decimal places of each axis machine coordinates	
141~160	Current Relative Coordinate Position	
161~180	Decimal places of each axis relative coordinates	
181~200	Current Absolute Coordinate Position	
201~220	Decimal points of each axis absolute coordinates	
221~240	Distance To Go	
241~260	Decimal Places for Axis Remaining Distance	
261~280	Axis Decimal Places	
301~320	Tool Length Compensation Vector	
341~360	Absolute Coordinate Home Offset	
401~420	Axis Velocity	Unit：BLU/min。
421~430	Spindle Speed	Unit：RPM。
431~450	Axis Torque Load	Represents the torque load with axis motor rated torque ratio. Unit：%
451~460	Spindle Torque Load	Represents the torque load with spindle motor rated torque ratio. Unit：%
461~465	Couple Master ID	range: one to max axis number
466~469	Couple Error	

471~474	Tolerance of Couple Error	when meet the condition below, this value is equal to Pr3828, Pr3868, Pr3878, Pr3888 setting. or this value equal to zero. 1. Master and slave ID setting are correct (Pr3821~, Pr3822~) 2. Factor of master and slave are the same(Pr3823~ = Pr3824~) 3. Couple type is Peer synchronous coupling(Pr3825 = 2)
475~479	State of Couple Calibration	0: Not Support Calibration 1: Not meet condition of calibration 2: Calibration Incomplete 3: Calibrating 4: Calibration Complete

2 Q Variable/Coordinate State Table

- Valid versions for supporting eHMI as source display: 10.116.24Q
- Applicable for general CNC path, Loader path

No.	Name	Descriptions
0	Path state	0：CNC path 4：Robot path (please refer to 机器人产品人机变数) 6：Loader path
1	Current cutter radius compensation value	Unit: IU
2	Current cutter radius compensation tool number	D code
3	Current tool length compensation tool number	H code
4	Controller State	• This variable gives the controller status of the axis group. • 0: Unready; 1: Ready; 2: Machining; 3: In Feedhold; 4: Block Paused; 5: In Execute Block.
5	Controller Mode	• This variable gives the controller mode of the axis group. • 2: Auto mode; 3: MDI; 4: manual JOG; 5: INCJOG; 6: MPG; 7: Home
6	Part Count	• This variable displays the number of finished workpieces in the axis group. • Every time Cycle Start is triggered, the controller will check whether this variable is equal to the target number of workpieces. If it is, this variable will be cleared. • This variable will be cleared every time the processing program is switched.
7	Required Part Count	• This variable displays the number of workpieces to be processed for the axis group.
8	Total Part Count	• This variable displays the number of total part count.

No.	Name	Descriptions
9	Part Count from Previous Machining	• This variable displays the number of workpieces processed last time for the axis group. • When the user logs out as a staff member, the controller will record the number of currently completed workpieces (K6) to this variable. • Every time Cycle Start is triggered, the controller will check whether the number of workpieces (K6) is equal to the number of target workpieces. If it is, this variable will be cleared. • This variable will be cleared every time the processing program is switched.
11~30	Current tool length compensation value of each axis	Unit: IU, corresponds to MACRO variable #1381~#1398 29~30: system reserved
31～39	Program coordinates	Unit: LIU, corresponds to XYZ/ABC/UVW program coordinates
40	Main spindle rotation speed	Unit: RPM
41	Main spindle load rate	Unit: %
43	Accumulated Alarmed Time of the day	• This variable displays the sum of the time that there is an alarm for the axis group on that day. • Unit: seconds.
45	Accumulated Machining Time of previous day	• This variable displays the sum of the time of each machining of the axis group on the previous day. • Unit: seconds.
46	Accumulated Alarmed Time of previous day	• This variable displays the sum of the time that alarms existed yesterday for the axis group. • Unit: seconds.
47	Cycle Time	• This variable displays the machining time of a single workpiece of the axis group. • Unit: seconds.
48	Accumulated Machining Time	• This variable displays the cumulative machining time of the axis group. • Unit: seconds.

No.	Name	Descriptions
49	Accumulated Cycle Start Time during last machining	• This variable displays the machining time of the previous single piece for the axis group. • When the user logs out as a staff, the controller will record the current cumulative single piece processing time (K39) to this variable. • Every time Cycle Start is triggered, the controller will check whether the number of workpieces (K6) is equal to the number of target workpieces. If it is, this variable will be cleared. • This variable will be cleared every time the processing program is switched. • Unit: seconds.
50	Accumulated Machining Time of the day	• This variable displays the sum of the machining time of the axis group on the day. • Unit: seconds.
56	Alarm Flag	• This variable is used to display whether an alarm occurs in the axis group. • When the axis group has an alarm, the value of this variable will be 1; when the axis group has no alarm, the value of this variable will be 0.
58	Warning Flag	• This variable is used to display whether a warning occurs in the axis group. • When the axis group has a warning, the value of this variable will be 1; when the axis group has no warning, the value of this variable will be 0.
63	Cycle Start Date - Year	• This variable gives the year in which last time Cycle Start was triggered on the axis group. • If Cycle Start has never been triggered, this variable gives the year in which the system was booted. • Effective only in AUTO mode.
64	Cycle Start Date - Month	• This variable gives the month in which last time Cycle Start was triggered on the axis group.. • If Cycle Start has never been triggered, this variable gives the month in which the system was booted. • Effective only in AUTO mode.

No.	Name	Descriptions
65	Cycle Start Date - Day	• This variable gives the day on which last time Cycle Start was triggered on the axis group. • If Cycle Start has never been triggered, this variable gives the day on which the system was booted. • Effective only in AUTO mode.
66	Cycle Start Time	• This variable gives the time at which last time Cycle Start was triggered on the axis group. • The format is the elapsed second since 00:00:00 that day. • If Cycle Start has never been triggered, this variable gives the time at which the system was booted. • Effective only in AUTO mode.
71	Interpolation Mode (G00/G01/G02/G33/G34/G35)	• This variable shows the interpolation mode of the axis group. • If the current interpolation mode is G00, this variable is 0; if the current interpolation mode is G01, this variable is 1, and so on.
72	Working Plane Mode (G17/G18/G19)	• This variable displays the work plane mode of the axis group. • If the current working plane mode is G17, this variable is 17; if the current working plane mode is G18, this variable is 18, and so on.
73	Absolute/Relative Input Command Mode (G90/G91)	• This variable shows the command mode of the axis group. • If the current command mode is G90, this variable is 90; if the current command mode is G91, this variable is 91.
74	Second Stroke Mode (G22/G23)	• This variable displays the second stroke mode of the axis group. • If the current second travel mode is G22, this variable is 22; if the current second travel mode is G23, this variable is 23.
75	Feedrate Mode (G94/G95)	• This variable displays the feed rate mode of the axis group. • If the current feed rate mode is G94, this variable is 94; if the current feed rate mode is G95, this variable is 95.

No.	Name	Descriptions
77	Cutter Radius Compensation Mode (G40/G41/G42)	• This variable displays the tool radius compensation mode of the axis group. • If the current compensation mode is G40, this variable is 40; if the current compensation mode is G41, this variable is 41, and so on.
78	Tool Length Compensation Mode (G43/G44/G49)	• This variable displays the tool length compensation mode of the axis group. • If the current compensation mode is G43, this variable is 43; if the current compensation mode is G44, this variable is 44, and so on.
79	Scaling Mode (G50/G51)	• This variable shows the zoom mode of the axis group. • If the current mode is G50, this variable is 50; if the current mode is G51, this variable is 51.
80	Constant Surface Speed Cutting Mode (G96/G97)	• This variable displays the constant surface speed cutting mode of the axis group. • If the current mode is G96, this variable is 96; if the current mode is G97, this variable is 97.
81	Current using RTCP mechanism chain set	Default value or the set P argument value of given G10 L5000 P_ command
82	Mechanism parameter setup value of current using RTCP mechanism chain	Corresponds to setup value of Q81 RTCP mechanism parameters Pr3001, Pr3101, Pr5501, Pr5601
83	Spindle Speed Checkup Mode (G25/G26)	• This variable displays the spindle speed check mode of the axis group. • If the current inspection mode is G25, this variable is 25; if the current inspection mode is G26, this variable is 26.
84	Polar Coordinates Interpolation Mode (G12/G13)	• This variable displays the polar coordinate difference mode of the axis group. • If the current mode is G12, this variable is 12; if the current mode is G13, this variable is 13.
85	Polar Coordinates Command Mode (G15/G16)	• This variable displays the polar coordinate command mode of the axis group. • If the current polar coordinate command mode is G15, this variable is 15; if the current polar coordinate command mode is G16, this variable is 16.

No.	Name	Descriptions
86	Feed Control Mode (G61/G62/G63/G64)	• This variable displays the feed rate control mode of the axis group. • If the current mode is G61, this variable is 61; if the current mode is G62, this variable is 62, and so on.
87	Coordinate Rotation mode (G68/G69)	• This variable displays the rotation mode of the axis group. • If the current mode is G68, this variable is 68; if the current mode is G69, this variable is 69.

For robot Q variable definition, please refer to 机器人产品人机变数

Q variable applying example:

<DisplayFormat>Double:3F</DisplayFormat>

<DisplaySource>Q1,$1</DisplaySource>

Q_：number represents the variable of path state

$_：represents the path number (0：main system path, 1~4：corresponds to 1st ~4th path)

3 **L Variable/Registry Data**

No.	Description
0~2099	reserved for ORX application
2100~3100	when Pr3228=1, backup tool manager data R2100 ~ R3100, else reserved for ORX application
3101~3899	reserved for ORX application
3900~3919	custom XMLDB open filename(5th group)
3920~3939	custom XMLDB open filename(4th group)
3940~3959	custom XMLDB open filename(3rd group)
3960~3979	custom XMLDB open filename(2nd group)
3980~3999	custom XMLDB open filename(1st group)
4000	graphic simulation draw mode
4001	graphic simulation path color
4002	graphic simulation cursor color
4003	graphic simulation quadrant
4004~4005	graphic simulation start block
4006~4007	graphic simulation end block
4008	graphic simulation rapid path color
4009	Alarm dialog mode, 0 => Enable popup alarm, 1 => disable popup alarm
4010	input mode for tool offset screen(wear for lathe)
4011	input mode for tool offset screen(length for lathe)
4012	input mode for tool offset screen(tool tip for lathe)
4013	input mode for tool offset screen(length for mill)

4016	Workpiece No. of choice for autotool mode two(one tool many workpiece)
4017	autotool Tool No. of choice for autotool mode three(many tools many workpiece)
4018	auto tool presetting and measuring screen; tool presetting and measuring machine setting: air blast ON M code
4019	auto tool presetting and measuring screen; tool presetting and measuring machine setting: air blast OFF M code
4020	ready flag for graphic simulation
4021	monitor screen state
4022	Manual/auto mode for outside-frame center searching function
4023	Manual/Threepts mode for outside-frame center searching function
4024	autotool mode(1.one tool one workpiece 2.one tool many workpiece 3.many tools many workpiece 4.five axes)
4025~4029	Z axis tool tip measurement function **4025** Workpiece No. of choice for autotool mode one(one tool one workpiece) **4026** autotool mode Feedrate **4027** autotool mode Use Reference Coordinate **4028** autotool mode Reference Z **4029** autotool mode Min Z Coordinate
4030	simulation mode(0:simulation; 1:direct draw; 2:NoSimulation; 3:Monitor)
4031	Vertical rotation angle of 3D graphics drawing
4032	Horzontal rotation angle of 3D graphics drawing
4033	X axis minimum bound value
4034	Y axis minimum bound value
4035	Z axis minimum bound value

4036	X axis maximum bound value
4037	Y axis maximum bound value
4038	Z axis maximum bound value
4039	Gauge Z Mach. Coord for 5 Axes AutoTool
4040~4069	edit program name
4070~4099	conversaional dialog editing program name
4100~4502	Alarm history listing
4700~4714	Parameter Password
4740~4769	Sub-Folder name which is editing program belongs to (conflict with **4750~4762** on 5-Axis model)
4750~4762	Feature Coordinate vector for 5-Axis model (conflict with **4740~4769** Sub-Folder name for editing program)
4770~4799	Sub-Folder name which is main program belongs to (conflict with **4780~4799** System Model backup data)
4780~4799	System Serial / Model / Machine / options backup data (conflict with **4770~4799** Sub-Folder name for main program)
4800~4819	System Security
4820~4999	CNC Browser Occupied
5001~5155	PLC persistent register, mapping to R100 ~ R255
5160~7847	persistent macro global variable, mapping to @656 ~ @1999
6000~9799	default manufacture tool compensation table(8 per set,400sets)(V8.00 and Before)persistent macro global variable(V9.00) (use before version 10.0)
9999	persistent memory write count
10000	input unit(0:metric;1:inch)

10001	flag to record that Work Record has been already updated
10002	required part count
10004	part count
10006	accumulate cutting time
10008	Version number of persistent macro global variable
10010	accumulate power-on time
10012	installation power-on time
10014	installation cutting time
10016	unsafe state flag
10018	total part count
10020	Start time of cutting time for work record function.
10022	Start time of cutting time for user-defined accumulator in monitor screen.
10024	Axis position offset exceed flag during power off (bitwise)
10026	last part count
10028	last accumulate cutting time
10030	Synchronization base difference: base angle difference of spindle synchronization
10031	Signal of 1st spindle synchronization: basic spindle datum angle
10032	Signal of 1st spindle synchronization: synchronous spindle datum angle
10033	Signal of 2nd spindle synchronization: basic spindle datum angle
10034	Signal of 2nd spindle synchronization: synchronous spindle datum angle
10035	Signal of 3rd spindle synchronization: basic spindle datum angle
10036	Signal of 3rd spindle synchronization: synchronous spindle datum angle

10042	Start processing time: the second axis group
10043	Start processing time: the third axis group
10044	Start processing time: the fourth axis group
10060~10089	System Serial / Model / Machine / options / Industrial Machine backup data
10100~10119	The meaning of this variable depends on whether the function "Axis Group Independency" is enabled or not: • When DISABLED, this variable represents the name of the file being executed of the "main system axis group". • When ENABLED, this variable represents the name of the file being executed of the "1st axis group".
10120~10139	Name of the file being executed of the 2nd axis group. CAUTION: The variable is ONLY effective when 1. The function "Axis Group Independency" is enabled. 2. The 2nd axis group is a main system axis group.
10140~10159	Name of the file being executed of the 3rd axis group. CAUTION: The variable is ONLY effective when 1. The function "Axis Group Independency" is enabled. 2. The 3rd axis group is a main system axis group.
10160~10179	Name of the file being executed of the 4th axis group. CAUTION: The variable is ONLY effective when 1. The function "Axis Group Independency" is enabled. 2. The 4th axis group is a main system axis group.
10200~10216	Tool length compensation module persistent state, tool number of 1~17 axes
10217~10220	Tool length compensation module persistent state for **first coordinate** **10217** tool number of D code **10218** tool number of H code **10219** direction of tool length compensation, -1/0/1 **10220** modal G code of tool length compensation, 43/44/43004/49
10221~10224	Tool length compensation module persistent state for **second coordinate**, as L10217~L10220
10225~10228	Tool length compensation module persistent state for **third coordinate**, as L10217~L10220

10229~10232	Tool length compensation module persistent state for **fourth coordinate**, as L10217~L10220
10233	Tool length compensation module persistent state, tool number 18th axis
10280~10283	the encoder feedback difference between 1st~4th couple master and slave when couple switch rise
10285~10288	validity of 1st~4th couple encoder feedback difference
10300~10303	Default workpiece number
10304	reserved
10305~10308	2nd path G92.1 I_J_K_R_ argument
10309	reserved
10310~10313	3rd path G92.1 I_J_K_R_ argument
10314	reserved
10315~10318	4th path G92.1 I_J_K_R_ argument
10319	reserved
10320~10337	G92 offset of each axis
10338~10339	reserved
10340~10343	1st path G92.1 I_J_K_R_ argument
10344	reserved
10345~10346	FCS offset of 17th~18th axis
10347~10349	reserved
10350~10365	FCS offset of 1st~16th axis
10366~10368	G68.2 I_J_K_ argument
10369	feature coordinate mode
10370~10387	HCS offset of 1st~18th axis
10388~10390	reserved
10391~10399	Tool coordinate array

10400~10419	External coordinates home offset (DOS)
10420~10423	record the target tool number, 10420 for 1st path, 10421 for 2nd path, 10422 for 3rd path, 10423 for 4th path
10500~10535	Home offset in nonvolatile encoder counter of 1st~18th axis
10536~10540	reserved
10541~10558	2nd soft stroke positive limit of 1st~18th axis
10559~10560	reserved
10561~10578	2nd soft stroke negative limit of 1st~18th axis
10579~10599	reserved
10600~10617	New Home offset in nonvolatile encoder counter of 1st~18th axis
10618~10619	reserved
10620~10655	Home offset of 1st~18th axis
10656~10659	reserved
10660~10677	Overflow lap counter of 1st~18th axis
10678~10679	reserved
10680~10699	System Quick-Param setting extension table, 10 long per record, Base+0: system parameter 404 Base+2: system parameter 408 Base+3: system parameter 401 Base+5: system parameter 407 10689: velocity level 10699: smooth level Valid version of the function: before 10.116.54A (included)

10700~11059	System high speed high precision extension table, 30 long per record, Base+0: system parameter 404, post acceleration Base+1: system parameter 406, corner feedrate Base+2: system parameter 408, arc reference feedrate Base+3: system parameter 401, cutting acceleration time Base+4: system parameter 402, acceleration accelerated to 1G time (Jerk) Base+5: system parameter 407, HPCC smoothing tolerance(um) [removed] Base+6: system parameter 3808, high precision smoothness(SPA) Base+7: system parameter 18, chord error tolerance [removed] Base+8: system parameter 405, maximum cutting feedrate Base+9: system parameter 3981, post accelerate filter type Base+11~Base+26: axis velocity feed forward percent. [removed]
11000~11399	system workpiece zero table(10 per set,40sets,DOSCNC)
12000~15199	system tool compensation table(8 per set,400sets)
28000~28017	1st~18th axis, WinCE external coordinates home offset
28018~28039	reserved
28021	Accumulated power-on time of the day
28022	Accumulated machining time of the day
28023	Accumulated alarmed time of the day
28024	Accumulated power-on time of previous day
28025	Accumulated machining time of previous day
28026	Accumulated alarmed time of previous day
28027	Date before power-off
28040~32039	system workpiece zero table(40 per set,100sets,WebCNC)
32040~32099	value-added application hidden data area
32100~32219	visual system parameter data area - ref 3.7 系统变量(R/L)使用介绍

32100~32115	record the IP of Smart Camera (16 characters)
32116~32131	record the account of Smart Camera (16 characters)
32132~32147	record the password of Smart Camera (16 characters)
32148~32151	Smart Camera Command Transmission Port
32152~32155	Smart Camera Image Transmission Port
32168~32171	whether to show graphics in auto mode (0：no, 1：normal (slow), 2：fast (possible to update to previous one))
32180	length setting of visual aided positioning box
32181	width setting of visual aided positioning box
32182	length setting of visual aided positioning cross arrow
32183	width setting of visual aided positioning cross arrow
32184	length setting of visual aided result displaying cross arrow
32185	width setting of visual aided result displaying cross arrow
32190	select the operating camera (0~4)：0: camera 1; 1: camera 2; 2: camera 3; 3: camera 4; 4: all cameras
32220~35999	value-added application hidden data area
36000~38999	reserved for CNC kernel
39000~39999	value added application R backup area (R10000~R10999 backup area)

<Notifications>

For subfolder function added in version 10.116.36, 10.117.36 (included), the applied L values are L4740~L4799

1. It conflicts with the L value range of existing tilted working plane teaching function of 5-axis machines, L4750~L4762. Thus, for 5-axis machines of these versions, please do not use the 2 functions at the same time or error might occur.
2. It conflicts with the backup data option, L4780~L4799, of system serial / model function. Thus, before the corrected version is released, please make sure the length of subfolder does not exceed 40 characters to avoid from being damaged.

4 **J Variable/Axis State**

- Valid versions for supporting eHMI as source display: 10.116.38N, 10.116.54L, 10.118.0G
- O means the device supports reading J value.

4.1 Shared J Variables

- Supporting device：Axis, Spindle, SerialPLC, ROT, AxisSpd, ATC。
- AxisSpd：Union of Axis and Spindle, act as Spindle when the device is both Axis and Spindle. Ex. Pr23 = 3(Z), Pr1621 = 3(S1), AxisSpd J5 will have axis name S1 at last, not Z.
- AxisSpd only supports shared J variables
- Shared J variable range: J1~J200。

No.	Name	Description
1 ~ 4	Reserved	Reserved
5	ID corresponds	Please check the chart with ID to find the axis name
6	Drive model ID	Please check the chart to find the model ID of kernel defined drive
10	Machine coordinates displaying precision (number of decimal points)	Determined by Pr17, SI/Imperial units and rotary/linear axis, fixed to 3 for SPLC and ROT. Applicable range：machine coordinates and relative coordinates
11	Absolute coordinates displaying precision (number of decimal points)	Determined by Pr17, SI/Imperial units and rotary/linear axis, fixed to 3 for SPLC and ROT. Applicable range: absolute coordinate and block remaining distance
12	Current machine coordinate command position	Unit： Axis: IU(mm/deg/inch) Spindle: not supported SPLC: mm ROT, ATC: deg AxisSpd: same as Axis, if it's spindle then not supported

No.	Name	Description
13	Current machine coordinate feedback position	Unit： Axis: IU(mm/deg/inch) Spindle: not supported SPLC: mm ROT, ATC: deg AxisSpd: same as Axis, if it's spindle then not supported
14	Rotation speed of feedback on screw side	Unit： Rotary Motor：rev/min Linear Motor：mm/min
27	No. of active driver loop gain set	record No. of active driver loop gain set range : [0~3] 0 : this revision not support 1 : the first gain set 2 : the second gain set 3 : the third gain set P.S. : Valid for version 10.118.28O, 10.118.38, or later.
39	Axis enabled or not	BOOL
40	Motor rotation speed	Unit： Rotary Motor：rev/min Linear Motor：mm/min
41	Rotor inertia	Unit： Rotary Motor：kg-m^2 Linear Motor：kg
42	Rated torque	Unit： Rotary Motor：N-m Linear Motor：N
43	Load rate	Unit： % (rated torque)

No.	Name	Description
44	Smooth load rate	Unit：% (rated torque)
60	Communication command error times	Increase by 1 when the command error value exceeds 1.2 times of movable distance when motor is in maximum speed (PnE80) When the axis is applied with Syntec M3, supports error checkup.
61	Multiplied times of compensation command error	When the compensation command exceeds the movable distance in maximum speed in 1 interpolation time, record the multiplied times of error value relative to the movable distance.
62	Multiplied times of planning command error	When the planning command exceeds 1.2 times of movable distance in maximum speed in 1 interpolation time, record the multiplied times of of error value relative to the movable distance.
68	Response packet error times	Increase by 1 when the command of response packet is wrong. Only supports series M3.
69	Position feedback error times	Increase by 1 when the position feedback value exceeds 4 times of maximum speed
73	Absolute watchdog increasing error times	Increase by 1 when the watchdog is not absolute increasing. If the value is not 0, possible causes are: hardware noise interference, loose communication cable, incorrect controller parameters settings and drive software abnormal.
74	Communication no response times	Increase by 1 when the communication no response error occurs after communication has been established. If the value is not 0, possible causes are: hardware noise interference, loose communication cable and incorrect controller parameters settings.
75	M3 command data error times	Increase by 1 when the M3 command data is wrong. If the value is not 0, possible cause is: hardware noise interference.

No.	Name	Description
76	M3 feedback packet CRC error times	Increase by 1 when the CRC of the M3 feedback packet calculated by the controller does not match the CRC provided by M3 IPCore after communication has been established. If the value is not 0, possible cause is: hardware noise interference.
77	Watchdog error times	Increase by 1 when both communication no response and M3 response CRC error did not occur, but the watchdog value is wrong after communication has been established. If the value is not 0, possible cause is: drive software abnormal.
78	Max continuous communication no response times	If the value is close to J74, it means that communication no response occurs more continuously.
79	Max continuous M3 response CRC error times	If the value is close to J76, it means that M3 response CRC error occurs more continuously.
80	Max Continuous watchdog error times	If the value is close to J77, it means that watchdog error occurs more continuously.
81	Encoder compensation state supported by each axis	Return value：LONG 0：not supporting 1：single feedback 1st encoder 2：single feedback 2nd encoder 3：dual feedback 2nd encoder
82	Whether the encoder eccentric error compensation function is enabled for each axis	Return value：BOOL 0：No 1：Yes
83	Whether load rate is supported by each axis	Return value：BOOL 0：No 1：Yes
100	Feedback Packet Error	Add 1 time when the received packet command from drive is undefined. Only supports serial M3.

4.2 Unshared J Variables

- Supporting device：Axis, Spindle, SerialPLC, ROT, ATC.
- Definition of variables after J201 can be defined by each device.

Axis   Spindle   SerialPLC   ROT   ATC

No.	Name	Description
201	Spike compensation state	-1 ~ 1 -1：Disabled 0：Position Spike Compensation 1：Speed Spike Compensation
202	Whether torque feedforward compensation is supported by each axis	LONG 0：Not supporting 1：Supporting 2：Unsure
203	Whether torque feedforward compensation state is learned	BOOL FALSE：Unlearned TRUE：Learned
230	The times of insufficient interpolation data accessing space	INT Unit：Times
265	Whether speed feedfoward compensation is supported by each axis	LONG 0：Not supporting 1：Supporting 2：Unsure
266	Pitch compensation distance	Unit：IU (mm or in)
267	Pitch compensation home	Determine the starting number of home in pitch compensation chart
268	Whether each axis is the hidden axis	0：No 1：Yes
269	Axis home searching state	0：Not set 1：Set 2：Home error 3：Running home searching

No.	Name	Description
271	The time from each axis drive receiving the command to sending the command to motor	DOUBLE Unit：us
272	The time gap between each axis drive feedback data and interrupting signal	DOUBLE Unit：us

J variable applying example：

<DisplaySource>J3,Ax2</DisplaySource>

J_：number represents the variable of axis state

Ax_：represent the axis number (Ax1：1st axis, Ax2：2nd axis...)

Axis   Spindle   SerialPLC   ROT   ATC

coming soon

Axis   Spindle   SerialPLC   ROT   ATC

coming soon

Axis   Spindle   SerialPLC   ROT   ATC

coming soon

Axis   Spindle   SerialPLC   ROT   ATC

No.	Name	Description
201	Axis Mode	LONG 0: Auto Mode 1: MPG Mode 2: Debug Mode 3: Home Searching Mode

No.	Name	Description
202	Axis Executing	BOOL TRUE: Yes FALSE: No
203	Axis Alarm	BOOL TRUE: Yes FALSE: No
204	Axis Ready	BOOL TRUE: Yes FALSE: No
205	Axis Zero Position Arriving	BOOL TRUE: Yes FALSE: No
206	Axis Home Setting Complete	BOOL TRUE: Yes FALSE: No
207	Tool Pre-unclamp Position	DOUBLE Unit：deg
208	Tool Pre-clamp Position	DOUBLE Unit：deg

SYNTEC

5 **VAR/STR Variable**

5.1 Resources define

STR		VAR	
number	**description**	**number**	**description**
		1~50	user data
1~100	system reserved	51~100	system reserved
101~200	NcEditor reserved	101~200	NcEditor reserved
201~230	Syntec worksheet reserved		
231~1000	system reserved	201~1000	system reserved

5.2 Variables

STR	
number	**description**
1-100	System Reserved
101-160	NcEditor Argument Temporary Storage
161-180	NcEditor Reserved
181	NcEditor Command Name Temporary Storage
182	NcEditor File Source Storage
183-186	NcEditor Search and Replace Storage
187-200	NcEditor Reserved
201-230	WorkSheet Reserved
231-1000	System Reserved

VAR	
number	description
1-50	User defined area
51-100	System Reserved
101-160	NcEditor Argument Temporary Storage
161-180	NcEditor Reserved
181-184	NcEditor Reserved
185	NcEditor Focus Line No.
186	NcEditor Focus Line Skip Status
200-799	System Reserved
800-1000	User defined area

Note

1. VAR1-50 User defined area: please make sure VAR status and reset to correct value before using.
2. Expanded to1000 after 10.118.29V, 10.118.38

6 CoordinateStateTable/Q Variable List

- Valid versions for supporting eHMI as source display: 10.116.24Q
- Applicable for general CNC path, Loader path

No.	Name	Descriptions
0	Path state	0：CNC path 4：Robot path (please refer to 机器人产品人机变数) 6：Loader path
1	Current cutter radius compensation value	Unit: IU
2	Current cutter radius compensation tool number	D code
3	Current tool length compensation tool number	H code
4	Controller State	• This variable gives the controller status of the axis group. • 0: Unready; 1: Ready; 2: Machining; 3: In Feedhold; 4: Block Paused; 5: In Execute Block.
5	Controller Mode	• This variable gives the controller mode of the axis group. • 2: Auto mode; 3: MDI; 4: manual JOG; 5: INCJOG; 6: MPG; 7: Home
6	Part Count	• This variable displays the number of finished workpieces in the axis group. • Every time Cycle Start is triggered, the controller will check whether this variable is equal to the target number of workpieces. If it is, this variable will be cleared. • This variable will be cleared every time the processing program is switched.
7	Required Part Count	• This variable displays the number of workpieces to be processed for the axis group.
8	Total Part Count	• This variable displays the number of total part count.

No.	Name	Descriptions
9	Part Count from Previous Machining	• This variable displays the number of workpieces processed last time for the axis group. • When the user logs out as a staff member, the controller will record the number of currently completed workpieces (K6) to this variable. • Every time Cycle Start is triggered, the controller will check whether the number of workpieces (K6) is equal to the number of target workpieces. If it is, this variable will be cleared. • This variable will be cleared every time the processing program is switched.
11~30	Current tool length compensation value of each axis	Unit: IU, corresponds to MACRO variable #1381~#1398 29~30: system reserved
31～39	Program coordinates	Unit: LIU, corresponds to XYZ/ABC/UVW program coordinates
40	Main spindle rotation speed	Unit: RPM
41	Main spindle load rate	Unit: %
43	Accumulated Alarmed Time of the day	• This variable displays the sum of the time that there is an alarm for the axis group on that day. • Unit: seconds.
45	Accumulated Machining Time of previous day	• This variable displays the sum of the time of each machining of the axis group on the previous day. • Unit: seconds.
46	Accumulated Alarmed Time of previous day	• This variable displays the sum of the time that alarms existed yesterday for the axis group. • Unit: seconds.
47	Cycle Time	• This variable displays the machining time of a single workpiece of the axis group. • Unit: seconds.
48	Accumulated Machining Time	• This variable displays the cumulative machining time of the axis group. • Unit: seconds.

No.	Name	Descriptions
49	Accumulated Cycle Start Time during last machining	• This variable displays the machining time of the previous single piece for the axis group. • When the user logs out as a staff, the controller will record the current cumulative single piece processing time (K39) to this variable. • Every time Cycle Start is triggered, the controller will check whether the number of workpieces (K6) is equal to the number of target workpieces. If it is, this variable will be cleared. • This variable will be cleared every time the processing program is switched. • Unit: seconds.
50	Accumulated Machining Time of the day	• This variable displays the sum of the machining time of the axis group on the day. • Unit: seconds.
56	Alarm Flag	• This variable is used to display whether an alarm occurs in the axis group. • When the axis group has an alarm, the value of this variable will be 1; when the axis group has no alarm, the value of this variable will be 0.
58	Warning Flag	• This variable is used to display whether a warning occurs in the axis group. • When the axis group has a warning, the value of this variable will be 1; when the axis group has no warning, the value of this variable will be 0.
63	Cycle Start Date - Year	• This variable gives the year in which last time Cycle Start was triggered on the axis group. • If Cycle Start has never been triggered, this variable gives the year in which the system was booted. • Effective only in AUTO mode.
64	Cycle Start Date - Month	• This variable gives the month in which last time Cycle Start was triggered on the axis group.. • If Cycle Start has never been triggered, this variable gives the month in which the system was booted. • Effective only in AUTO mode.

No.	Name	Descriptions
65	Cycle Start Date - Day	• This variable gives the day on which last time Cycle Start was triggered on the axis group. • If Cycle Start has never been triggered, this variable gives the day on which the system was booted. • Effective only in AUTO mode.
66	Cycle Start Time	• This variable gives the time at which last time Cycle Start was triggered on the axis group. • The format is the elapsed second since 00:00:00 that day. • If Cycle Start has never been triggered, this variable gives the time at which the system was booted. • Effective only in AUTO mode.
71	Interpolation Mode (G00/G01/G02/G33/G34/G35)	• This variable shows the interpolation mode of the axis group. • If the current interpolation mode is G00, this variable is 0; if the current interpolation mode is G01, this variable is 1, and so on.
72	Working Plane Mode (G17/G18/G19)	• This variable displays the work plane mode of the axis group. • If the current working plane mode is G17, this variable is 17; if the current working plane mode is G18, this variable is 18, and so on.
73	Absolute/Relative Input Command Mode (G90/G91)	• This variable shows the command mode of the axis group. • If the current command mode is G90, this variable is 90; if the current command mode is G91, this variable is 91.
74	Second Stroke Mode (G22/G23)	• This variable displays the second stroke mode of the axis group. • If the current second travel mode is G22, this variable is 22; if the current second travel mode is G23, this variable is 23.
75	Feedrate Mode (G94/G95)	• This variable displays the feed rate mode of the axis group. • If the current feed rate mode is G94, this variable is 94; if the current feed rate mode is G95, this variable is 95.

No.	Name	Descriptions
77	Cutter Radius Compensation Mode (G40/G41/G42)	• This variable displays the tool radius compensation mode of the axis group. • If the current compensation mode is G40, this variable is 40; if the current compensation mode is G41, this variable is 41, and so on.
78	Tool Length Compensation Mode (G43/G44/G49)	• This variable displays the tool length compensation mode of the axis group. • If the current compensation mode is G43, this variable is 43; if the current compensation mode is G44, this variable is 44, and so on.
79	Scaling Mode (G50/G51)	• This variable shows the zoom mode of the axis group. • If the current mode is G50, this variable is 50; if the current mode is G51, this variable is 51.
80	Constant Surface Speed Cutting Mode (G96/G97)	• This variable displays the constant surface speed cutting mode of the axis group. • If the current mode is G96, this variable is 96; if the current mode is G97, this variable is 97.
81	Current using RTCP mechanism chain set	Default value or the set P argument value of given G10 L5000 P_ command
82	Mechanism parameter setup value of current using RTCP mechanism chain	Corresponds to setup value of Q81 RTCP mechanism parameters Pr3001, Pr3101, Pr5501, Pr5601
83	Spindle Speed Checkup Mode (G25/G26)	• This variable displays the spindle speed check mode of the axis group. • If the current inspection mode is G25, this variable is 25; if the current inspection mode is G26, this variable is 26.
84	Polar Coordinates Interpolation Mode (G12/G13)	• This variable displays the polar coordinate difference mode of the axis group. • If the current mode is G12, this variable is 12; if the current mode is G13, this variable is 13.
85	Polar Coordinates Command Mode (G15/G16)	• This variable displays the polar coordinate command mode of the axis group. • If the current polar coordinate command mode is G15, this variable is 15; if the current polar coordinate command mode is G16, this variable is 16.

No.	Name	Descriptions
86	Feed Control Mode (G61/G62/G63/G64)	• This variable displays the feed rate control mode of the axis group. • If the current mode is G61, this variable is 61; if the current mode is G62, this variable is 62, and so on.
87	Coordinate Rotation mode (G68/G69)	• This variable displays the rotation mode of the axis group. • If the current mode is G68, this variable is 68; if the current mode is G69, this variable is 69.

7 NcStateTable/K Variable List

- K variables are state variables, read only

No.	Name	Descriptions
0	Version Number	Format: XXxxYYYyXX Version No.xx Sub-Version No.YYY Candidate No.y Sub-Candidate No.
1	Running Compound Feedrate	LIU/min, 1 LIU = 0.001 mm in SI units; 0.0001 inch in Imperial units
2	Tool Number	
3	Running Spindle Speed	RPM
4	Controller State	• This variable gives the controller status of the axis group specified by R781. • 0: Unready; 1: Ready; 2: Machining; 3: In Feedhold; 4: Block Paused; 5: In Execute Block.
5	Controller Mode	• This variable gives the controller mode of the axis group specified by R781. • 2: Auto mode; 3: MDI; 4: manual JOG; 5: INCJOG; 6: MPG; 7: Home
6	Part Count	• This variable displays the number of finished workpieces in the axis group specified by R781. • Every time Cycle Start is triggered, the controller will check whether this variable is equal to the target number of workpieces. If it is, this variable will be cleared. • This variable will be cleared every time the processing program is switched.
7	Required Part Count	• This variable displays the number of workpieces to be processed for the axis group specified by R781.
8	Cycle Time	• This variable displays the machining time of a single workpiece of the axis group specified by R781. • Unit: seconds.

9	Accumulated Machining Time	• This variable displays the cumulative machining time of the axis group specified by R781. • Unit: seconds.
10	Running Line Number	
11	Running Serial Number	
12	Decimal Places for Linear Axis	
13	Current Input Unit	0: SI units; 1: Imperial units
14	Decimal Places for Rotary Axis	
15	Cutter Radius Compensation Number D	
16	Tool Length Compensation Number H	
17	Spindle Maximum Speed Smax	
18	Feedrate Command F	LIU/min or LIU/rev, according to G94/G95 mode
19	G01 Feedrate Override	Range: -200~200
20	Spindle Speed Command	RPM
21	Spindle Speed Override	Range: 0~120
22	Accumulated Power On Time	second
23	MPG Rate	1,10,100, custom
24	Spindle Gear	Range: 0~3, 0: Neutral; 1~3: 1~3 gear
25	Current Workpiece Coordinates Number	Range: 0~40, 40 sets 1:G54; 2:G55; 3:G56; 4:G57; 5:G58; 6:G59; 7:G54 P7; …
26	Power On Time	second
27	The number of axis group in CNC system	1~4

28	Active axis group of CNC system	Binary, for Bit values below, the decimal forms and corresponding paths are: Bit0 → 1: Non Bit1 → 2: $1 Bit2 → 4: $2 Bit3 → 8: $3 Bit4 → 16: $4
29	Active number of high precision high speed parameter	Multiple HSHP parameter sets, current applying set N (N=0~9). Set 0 is the built-in set after system reset, which is the parameter setting value
30	G00 Feedrate Override	F0, 25, 50, 100 It will be selecting F0 when the return value from kernel is 9999
31	Serial Number of 1st Path	
32	Line Number of 1st Path	
33	Serial Number of 2nd Path	
34	Line Number of 2nd Path	
35	Serial Number of 3rd Path	
36	Line Number of 3rd Path	
37	Serial Number of 4th Path	
38	Line Number of 4th Path	
39	Accumulated Cycle Start Time during machining	• This variable displays the cumulative single piece machining time of the axis group specified by R781. • Every time Cycle Start is triggered, the controller will check whether the number of workpieces (K6) is equal to the number of target workpieces. If it is, this variable will be cleared. • This variable will be cleared every time the processing program is switched. • Unit: seconds.

40	Accumulated Cycle Start Time during last machining	• This variable displays the machining time of the previous single piece for the axis group specified by R781. • When the user logs out as a staff, the controller will record the current cumulative single piece processing time (K39) to this variable. • Every time Cycle Start is triggered, the controller will check whether the number of workpieces (K6) is equal to the number of target workpieces. If it is, this variable will be cleared. • This variable will be cleared every time the processing program is switched. • Unit: seconds.
41	Accumulated Power On Time of the day	• Cumulative boot time of the day. • Unit: seconds.
42	Accumulated Machining Time of the day	• This variable displays the sum of the machining time of the axis group specified by R781 on the day. • Unit: seconds.
43	Accumulated Alarmed Time of the day	• This variable displays the sum of the time that there is an alarm for the axis group specified by R781 on that day. • Unit: seconds.
44	Accumulated Power On Time of previous day	• Cumulative boot time of yesterday. • Unit: seconds.
45	Accumulated Machining Time of previous day	• This variable displays the sum of the time of each machining of the axis group specified by R781 on the previous day. • Unit: seconds.
46	Accumulated Alarmed Time of previous day	• This variable displays the sum of the time that alarms existed yesterday for the axis group specified by R781. • Unit: seconds.

47	Part Count from Previous Machining	• This variable displays the number of workpieces processed last time for the axis group specified by R781. • When the user logs out as a staff member, the controller will record the number of currently completed workpieces (K6) to this variable. • Every time Cycle Start is triggered, the controller will check whether the number of workpieces (K6) is equal to the number of target workpieces. If it is, this variable will be cleared. • This variable will be cleared every time the processing program is switched.
50	Tool List Accessing Method	0：single axis; 1：multiple axis
51	Guidance remain distance	LIU
52	Guidance remain distance in x-direction	LIU
53	Guidance remain distance in y-direction	LIU
54	Whether Syntec drive supports unpackaged motor parameter return	0: No Syntec Drive 1: With Syntec Drive and supports unpackaged motor parameter return 2: With Syntec Drive but not supporting unpackaged motor parameter return
55	flag for Syntec unpackaged motor	0: no Syntec unpackaged motor; 1: connected with Syntec unpackaged motor
56	System Alarm	• This variable is used to display whether an alarm occurs in the axis group specified by R781. • When the axis group has an alarm, the value of this variable will be 1; when the axis group has no alarm, the value of this variable will be 0. • When R781 is set to 1, if there are system-level alarms (ROT, SPLCA, SRI, LaserCtrl), the value of this variable will also be 1.
57	PLC Alarm	This flag will be ON when there's a PLC alarm; OFF when the alarms are solved. The first 16 bits of R40~R49 (R4x.0~R4x.15) are PLC alarm messages, the PLC warning message after the 16 bits won't trigger K57.

58	System Warning	• This variable is used to display whether a warning occurs in the axis group specified by R781. • When the axis group has a warning, the value of this variable will be 1; when the axis group has no warning, the value of this variable will be 0.
59	PLC Warning	This flag will be ON when there's a PLC warning; OFF when the warnings are dismissed.
61	Interpolation Mode of current machining process	
62	Block Feedrate Command (F code) while interpolation	For non-ROBOT system, unit: LIU/min or LIU/rev; for ROBOT system, unit: mm/s or %
63	Cycle Start Date - Year	• This variable gives the year in which last time Cycle Start was triggered on the axis group specified by R781. • If Cycle Start has never been triggered, this variable gives the year in which the system was booted. • Effective only in AUTO mode.
64	Cycle Start Date - Month	• This variable gives the month in which last time Cycle Start was triggered on the axis group specified by R781.. • If Cycle Start has never been triggered, this variable gives the month in which the system was booted. • Effective only in AUTO mode.
65	Cycle Start Date - Day	• This variable gives the day on which last time Cycle Start was triggered on the axis group specified by R781. • If Cycle Start has never been triggered, this variable gives the day on which the system was booted. • Effective only in AUTO mode.
66	Cycle Start Time	• This variable gives the time at which last time Cycle Start was triggered on the axis group specified by R781. • The format is the elapsed second since 00:00:00 that day. • If Cycle Start has never been triggered, this variable gives the time at which the system was booted. • Effective only in AUTO mode.

71	Interpolation Mode, G00/G01/G02/G33/G34/G35	• This variable shows the interpolation mode of the axis group specified by R781. • If the current interpolation mode is G00, this variable is 0; if the current interpolation mode is G01, this variable is 1, and so on.
72	Working Plane Mode, G17/G18/G19	• This variable displays the work plane mode of the axis group specified by R781. • If the current working plane mode is G17, this variable is 17; if the current working plane mode is G18, this variable is 18, and so on.
73	Absolute/Relative Input Command Mode, G90/G91	• This variable shows the command mode of the axis group specified by R781. • If the current command mode is G90, this variable is 90; if the current command mode is G91, this variable is 91.
74	Second Stroke Mode, G22/G23	• This variable displays the second stroke mode of the axis group specified by R781. • If the current second travel mode is G22, this variable is 22; if the current second travel mode is G23, this variable is 23.
75	Feedrate Mode, G94/G95	• This variable displays the feed rate mode of the axis group specified by R781. • If the current feed rate mode is G94, this variable is 94; if the current feed rate mode is G95, this variable is 95.
76	SI/Imperial Units Input Dimension Mode, G70/G71	• This variable displays the metric and inch mode of the axis group specified by R781. • If the current metric and inch system mode is G70, this variable is 70; if the current metric and inch system mode is G01, this variable is 71.
77	Cutter Radius Compensation Mode, G40/G41/G42	• This variable displays the tool radius compensation mode of the axis group specified by R781. • If the current compensation mode is G40, this variable is 40; if the current compensation mode is G41, this variable is 41, and so on.
78	Tool Length Compensation Mode, G43/G44/G49	• This variable displays the tool length compensation mode of the axis group specified by R781. • If the current compensation mode is G43, this variable is 43; if the current compensation mode is G44, this variable is 44, and so on.

79	Scaling Mode, G50/G51	• This variable shows the zoom mode of the axis group specified by R781. • If the current mode is G50, this variable is 50; if the current mode is G51, this variable is 51.
80	Constant Surface Speed Cutting Mode, G96/G97	• This variable displays the constant surface speed cutting mode of the axis group specified by R781. • If the current mode is G96, this variable is 96; if the current mode is G97, this variable is 97.
81	Feed Control Mode, G61/G62/G63/G64	• This variable displays the feed rate control mode of the axis group specified by R781. • If the current mode is G61, this variable is 61; if the current mode is G62, this variable is 62, and so on.
82	Coordinate Rotation mode, G68/G69	• This variable displays the rotation mode of the axis group specified by R781. • If the current mode is G68, this variable is 68; if the current mode is G69, this variable is 69.
83	Spindle Speed Checkup Mode, G25/G26	• This variable displays the spindle speed check mode of the axis group designated by R781. • If the current inspection mode is G25, this variable is 25; if the current inspection mode is G26, this variable is 26.
84	Polar Coordinates Interpolation Mode, G12/G13	• This variable displays the polar coordinate difference mode of the axis group specified by R781. • If the current mode is G12, this variable is 12; if the current mode is G13, this variable is 13.
85	Polar Coordinates Command Mode, G15/G16	• This variable displays the polar coordinate command mode of the axis group specified by R781. • If the current polar coordinate command mode is G15, this variable is 15; if the current polar coordinate command mode is G16, this variable is 16.
100	IO Support Function	Bit 0：Support Restoring IOMap_Customer.xml Bit 1：Support Single IOMap Note: 1. This variable gives 0 when the I/O function is disabled (Pr5 is set to 9). 2. This variable is supported in 10.118.23W, 10.118.28J, 10.118.35, and later.

101~120	Current Machine Coordinate Position	
121~140	Decimal places of each axis machine coordinates	
141~160	Current Relative Coordinate Position	
161~180	Decimal places of each axis relative coordinates	
181~200	Current Absolute Coordinate Position	
201~220	Decimal points of each axis absolute coordinates	
221~240	Distance To Go	
241~260	Decimal Places for Axis Remaining Distance	
261~280	Axis Decimal Places	
301~320	Tool Length Compensation Vector	
341~360	Absolute Coordinate Home Offset	
401~420	Axis Velocity	Unit：BLU/min。
421~430	Spindle Speed	Unit：RPM。
431~450	Axis Torque Load	Represents the torque load with axis motor rated torque ratio. Unit：%
451~460	Spindle Torque Load	Represents the torque load with spindle motor rated torque ratio. Unit：%
461~465	Couple Master ID	range: one to max axis number
466~469	Couple Error	

471~474	Tolerance of Couple Error	when meet the condition below, this value is equal to Pr3828, Pr3868, Pr3878, Pr3888 setting. or this value equal to zero. 1. Master and slave ID setting are correct (Pr3821~, Pr3822~) 2. Factor of master and slave are the same(Pr3823~ = Pr3824~) 3. Couple type is Peer synchronous coupling(Pr3825 = 2)
475~479	State of Couple Calibration	0: Not Support Calibration 1: Not meet condition of calibration 2: Calibration Incomplete 3: Calibrating 4: Calibration Complete

8 Registry Data/L Variable List

No.	Description
0~2099	reserved for ORX application
2100~3100	when Pr3228=1, backup tool manager data R2100 ~ R3100, else reserved for ORX application
3101~3899	reserved for ORX application
3900~3919	custom XMLDB open filename(5th group)
3920~3939	custom XMLDB open filename(4th group)
3940~3959	custom XMLDB open filename(3rd group)
3960~3979	custom XMLDB open filename(2nd group)
3980~3999	custom XMLDB open filename(1st group)
4000	graphic simulation draw mode
4001	graphic simulation path color
4002	graphic simulation cursor color
4003	graphic simulation quadrant
4004~4005	graphic simulation start block
4006~4007	graphic simulation end block
4008	graphic simulation rapid path color
4009	Alarm dialog mode, 0 => Enable popup alarm, 1 => disable popup alarm
4010	input mode for tool offset screen(wear for lathe)
4011	input mode for tool offset screen(length for lathe)
4012	input mode for tool offset screen(tool tip for lathe)
4013	input mode for tool offset screen(length for mill)

4016	Workpiece No. of choice for autotool mode two(one tool many workpiece)
4017	autotool Tool No. of choice for autotool mode three(many tools many workpiece)
4018	auto tool presetting and measuring screen; tool presetting and measuring machine setting: air blast ON M code
4019	auto tool presetting and measuring screen; tool presetting and measuring machine setting: air blast OFF M code
4020	ready flag for graphic simulation
4021	monitor screen state
4022	Manual/auto mode for outside-frame center searching function
4023	Manual/Threepts mode for outside-frame center searching function
4024	autotool mode(1.one tool one workpiece 2.one tool many workpiece 3.many tools many workpiece 4.five axes)
4025~4029	Z axis tool tip measurement function **4025** Workpiece No. of choice for autotool mode one(one tool one workpiece) **4026** autotool mode Feedrate **4027** autotool mode Use Reference Coordinate **4028** autotool mode Reference Z **4029** autotool mode Min Z Coordinate
4030	simulation mode(0:simulation; 1:direct draw; 2:NoSimulation; 3:Monitor)
4031	Vertical rotation angle of 3D graphics drawing
4032	Horzontal rotation angle of 3D graphics drawing
4033	X axis minimum bound value
4034	Y axis minimum bound value
4035	Z axis minimum bound value

4036	X axis maximum bound value
4037	Y axis maximum bound value
4038	Z axis maximum bound value
4039	Gauge Z Mach. Coord for 5 Axes AutoTool
4040~4069	edit program name
4070~4099	conversaional dialog editing program name
4100~4502	Alarm history listing
4700~4714	Parameter Password
4740~4769	Sub-Folder name which is editing program belongs to (conflict with **4750~4762** on 5-Axis model)
4750~4762	Feature Coordinate vector for 5-Axis model (conflict with **4740~4769** Sub-Folder name for editing program)
4770~4799	Sub-Folder name which is main program belongs to (conflict with **4780~4799** System Model backup data)
4780~4799	System Serial / Model / Machine / options backup data (conflict with **4770~4799** Sub-Folder name for main program)
4800~4819	System Security
4820~4999	CNC Browser Occupied
5001~5155	PLC persistent register, mapping to R100 ~ R255
5160~7847	persistent macro global variable, mapping to @656 ~ @1999
6000~9799	default manufacture tool compensation table(8 per set,400sets)(V8.00 and Before)persistent macro global variable(V9.00) (use before version 10.0)
9999	persistent memory write count
10000	input unit(0:metric;1:inch)

10001	flag to record that Work Record has been already updated
10002	required part count
10004	part count
10006	accumulate cutting time
10008	Version number of persistent macro global variable
10010	accumulate power-on time
10012	installation power-on time
10014	installation cutting time
10016	unsafe state flag
10018	total part count
10020	Start time of cutting time for work record function.
10022	Start time of cutting time for user-defined accumulator in monitor screen.
10024	Axis position offset exceed flag during power off (bitwise)
10026	last part count
10028	last accumulate cutting time
10030	Synchronization base difference: base angle difference of spindle synchronization
10031	Signal of 1st spindle synchronization: basic spindle datum angle
10032	Signal of 1st spindle synchronization: synchronous spindle datum angle
10033	Signal of 2nd spindle synchronization: basic spindle datum angle
10034	Signal of 2nd spindle synchronization: synchronous spindle datum angle
10035	Signal of 3rd spindle synchronization: basic spindle datum angle
10036	Signal of 3rd spindle synchronization: synchronous spindle datum angle

10042	Start processing time: the second axis group
10043	Start processing time: the third axis group
10044	Start processing time: the fourth axis group
10060~10089	System Serial / Model / Machine / options / Industrial Machine backup data
10100~10119	The meaning of this variable depends on whether the function "Axis Group Independency" is enabled or not: • When DISABLED, this variable represents the name of the file being executed of the "main system axis group". • When ENABLED, this variable represents the name of the file being executed of the "1st axis group".
10120~10139	Name of the file being executed of the 2nd axis group. CAUTION: The variable is ONLY effective when 1. The function "Axis Group Independency" is enabled. 2. The 2nd axis group is a main system axis group.
10140~10159	Name of the file being executed of the 3rd axis group. CAUTION: The variable is ONLY effective when 1. The function "Axis Group Independency" is enabled. 2. The 3rd axis group is a main system axis group.
10160~10179	Name of the file being executed of the 4th axis group. CAUTION: The variable is ONLY effective when 1. The function "Axis Group Independency" is enabled. 2. The 4th axis group is a main system axis group.
10200~10216	Tool length compensation module persistent state, tool number of 1~17 axes
10217~10220	Tool length compensation module persistent state for **first coordinate** **10217** tool number of D code **10218** tool number of H code **10219** direction of tool length compensation, -1/0/1 **10220** modal G code of tool length compensation, 43/44/43004/49
10221~10224	Tool length compensation module persistent state for **second coordinate**, as L10217~L10220
10225~10228	Tool length compensation module persistent state for **third coordinate**, as L10217~L10220

10229~10232	Tool length compensation module persistent state for **fourth coordinate**, as L10217~L10220
10233	Tool length compensation module persistent state, tool number 18th axis
10280~10283	the encoder feedback difference between 1st~4th couple master and slave when couple switch rise
10285~10288	validity of 1st~4th couple encoder feedback difference
10300~10303	Default workpiece number
10304	reserved
10305~10308	2nd path G92.1 I_J_K_R_ argument
10309	reserved
10310~10313	3rd path G92.1 I_J_K_R_ argument
10314	reserved
10315~10318	4th path G92.1 I_J_K_R_ argument
10319	reserved
10320~10337	G92 offset of each axis
10338~10339	reserved
10340~10343	1st path G92.1 I_J_K_R_ argument
10344	reserved
10345~10346	FCS offset of 17th~18th axis
10347~10349	reserved
10350~10365	FCS offset of 1st~16th axis
10366~10368	G68.2 I_J_K_ argument
10369	feature coordinate mode
10370~10387	HCS offset of 1st~18th axis
10388~10390	reserved
10391~10399	Tool coordinate array

10400~10419	External coordinates home offset (DOS)
10420~10423	record the target tool number, 10420 for 1st path, 10421 for 2nd path, 10422 for 3rd path, 10423 for 4th path
10500~10535	Home offset in nonvolatile encoder counter of 1st~18th axis
10536~10540	reserved
10541~10558	2nd soft stroke positive limit of 1st~18th axis
10559~10560	reserved
10561~10578	2nd soft stroke negative limit of 1st~18th axis
10579~10599	reserved
10600~10617	New Home offset in nonvolatile encoder counter of 1st~18th axis
10618~10619	reserved
10620~10655	Home offset of 1st~18th axis
10656~10659	reserved
10660~10677	Overflow lap counter of 1st~18th axis
10678~10679	reserved
10680~10699	System Quick-Param setting extension table, 10 long per record, Base+0: system parameter 404 Base+2: system parameter 408 Base+3: system parameter 401 Base+5: system parameter 407 10689: velocity level 10699: smooth level Valid version of the function: before 10.116.54A (included)

10700~11059	System high speed high precision extension table, 30 long per record, Base+0: system parameter 404, post acceleration Base+1: system parameter 406, corner feedrate Base+2: system parameter 408, arc reference feedrate Base+3: system parameter 401, cutting acceleration time Base+4: system parameter 402, acceleration accelerated to 1G time (Jerk) Base+5: system parameter 407, HPCC smoothing tolerance(um) [removed] Base+6: system parameter 3808, high precision smoothness(SPA) Base+7: system parameter 18, chord error tolerance [removed] Base+8: system parameter 405, maximum cutting feedrate Base+9: system parameter 3981, post accelerate filter type Base+11~Base+26: axis velocity feed forward percent. [removed]
11000~11399	system workpiece zero table(10 per set,40sets,DOSCNC)
12000~15199	system tool compensation table(8 per set,400sets)
28000~28017	1st~18th axis, WinCE external coordinates home offset
28018~28039	reserved
28021	Accumulated power-on time of the day
28022	Accumulated machining time of the day
28023	Accumulated alarmed time of the day
28024	Accumulated power-on time of previous day
28025	Accumulated machining time of previous day
28026	Accumulated alarmed time of previous day
28027	Date before power-off
28040~32039	system workpiece zero table(40 per set,100sets,WebCNC)
32040~32099	value-added application hidden data area
32100~32219	visual system parameter data area - ref 3.7 系统变量(R/L)使用介绍

32100~32115	record the IP of Smart Camera (16 characters)
32116~32131	record the account of Smart Camera (16 characters)
32132~32147	record the password of Smart Camera (16 characters)
32148~32151	Smart Camera Command Transmission Port
32152~32155	Smart Camera Image Transmission Port
32168~32171	whether to show graphics in auto mode (0：no, 1：normal (slow), 2：fast (possible to update to previous one))
32180	length setting of visual aided positioning box
32181	width setting of visual aided positioning box
32182	length setting of visual aided positioning cross arrow
32183	width setting of visual aided positioning cross arrow
32184	length setting of visual aided result displaying cross arrow
32185	width setting of visual aided result displaying cross arrow
32190	select the operating camera (0~4)：0: camera 1; 1: camera 2; 2: camera 3; 3: camera 4; 4: all cameras
32220~35999	value-added application hidden data area
36000~38999	reserved for CNC kernel
39000~39999	value added application R backup area (R10000~R10999 backup area)

<Notifications>

For subfolder function added in version 10.116.36, 10.117.36 (included), the applied L values are L4740~L4799

1. It conflicts with the L value range of existing tilted working plane teaching function of 5-axis machines, L4750~L4762. Thus, for 5-axis machines of these versions, please do not use the 2 functions at the same time or error might occur.
2. It conflicts with the backup data option, L4780~L4799, of system serial / model function. Thus, before the corrected version is released, please make sure the length of subfolder does not exceed 40 characters to avoid from being damaged.

9 SvoDeviceStateTable/J Variable List

- Valid versions for supporting eHMI as source display: 10.116.38N, 10.116.54L, 10.118.0G
- O means the device supports reading J value.

9.1 Shared J Variables

- Supporting device：Axis, Spindle, SerialPLC, ROT, AxisSpd, ATC。
- AxisSpd：Union of Axis and Spindle, act as Spindle when the device is both Axis and Spindle. Ex. Pr23 = 3(Z), Pr1621 = 3(S1), AxisSpd J5 will have axis name S1 at last, not Z.
- AxisSpd only supports shared J variables
- Shared J variable range: J1~J200。

No.	Name	Description
1 ~ 4	Reserved	Reserved
5	ID corresponds	Please check the chart with ID to find the axis name
6	Drive model ID	Please check the chart to find the model ID of kernel defined drive
10	Machine coordinates displaying precision (number of decimal points)	Determined by Pr17, SI/Imperial units and rotary/linear axis, fixed to 3 for SPLC and ROT. Applicable range：machine coordinates and relative coordinates
11	Absolute coordinates displaying precision (number of decimal points)	Determined by Pr17, SI/Imperial units and rotary/linear axis, fixed to 3 for SPLC and ROT. Applicable range: absolute coordinate and block remaining distance
12	Current machine coordinate command position	Unit： Axis: IU(mm/deg/inch) Spindle: not supported SPLC: mm ROT, ATC: deg AxisSpd: same as Axis, if it's spindle then not supported

No.	Name	Description
13	Current machine coordinate feedback position	Unit： Axis: IU(mm/deg/inch) Spindle: not supported SPLC: mm ROT, ATC: deg AxisSpd: same as Axis, if it's spindle then not supported
14	Rotation speed of feedback on screw side	Unit： Rotary Motor：rev/min Linear Motor：mm/min
27	No. of active driver loop gain set	record No. of active driver loop gain set range : [0~3] 0 : this revision not support 1 : the first gain set 2 : the second gain set 3 : the third gain set P.S. : Valid for version 10.118.28O, 10.118.38, or later.
39	Axis enabled or not	BOOL
40	Motor rotation speed	Unit： Rotary Motor：rev/min Linear Motor：mm/min
41	Rotor inertia	Unit： Rotary Motor：kg-m^2 Linear Motor：kg
42	Rated torque	Unit： Rotary Motor：N-m Linear Motor：N
43	Load rate	Unit： % (rated torque)

No.	Name	Description
44	Smooth load rate	Unit：% (rated torque)
60	Communication command error times	Increase by 1 when the command error value exceeds 1.2 times of movable distance when motor is in maximum speed (PnE80) When the axis is applied with Syntec M3, supports error checkup.
61	Multiplied times of compensation command error	When the compensation command exceeds the movable distance in maximum speed in 1 interpolation time, record the multiplied times of error value relative to the movable distance.
62	Multiplied times of planning command error	When the planning command exceeds 1.2 times of movable distance in maximum speed in 1 interpolation time, record the multiplied times of of error value relative to the movable distance.
68	Response packet error times	Increase by 1 when the command of response packet is wrong. Only supports series M3.
69	Position feedback error times	Increase by 1 when the position feedback value exceeds 4 times of maximum speed
73	Absolute watchdog increasing error times	Increase by 1 when the watchdog is not absolute increasing. If the value is not 0, possible causes are: hardware noise interference, loose communication cable, incorrect controller parameters settings and drive software abnormal.
74	Communication no response times	Increase by 1 when the communication no response error occurs after communication has been established. If the value is not 0, possible causes are: hardware noise interference, loose communication cable and incorrect controller parameters settings.
75	M3 command data error times	Increase by 1 when the M3 command data is wrong. If the value is not 0, possible cause is: hardware noise interference.

No.	Name	Description
76	M3 feedback packet CRC error times	Increase by 1 when the CRC of the M3 feedback packet calculated by the controller does not match the CRC provided by M3 IPCore after communication has been established. If the value is not 0, possible cause is: hardware noise interference.
77	Watchdog error times	Increase by 1 when both communication no response and M3 response CRC error did not occur, but the watchdog value is wrong after communication has been established. If the value is not 0, possible cause is: drive software abnormal.
78	Max continuous communication no response times	If the value is close to J74, it means that communication no response occurs more continuously.
79	Max continuous M3 response CRC error times	If the value is close to J76, it means that M3 response CRC error occurs more continuously.
80	Max Continuous watchdog error times	If the value is close to J77, it means that watchdog error occurs more continuously.
81	Encoder compensation state supported by each axis	Return value：LONG 0：not supporting 1：single feedback 1st encoder 2：single feedback 2nd encoder 3：dual feedback 2nd encoder
82	Whether the encoder eccentric error compensation function is enabled for each axis	Return value：BOOL 0：No 1：Yes
83	Whether load rate is supported by each axis	Return value：BOOL 0：No 1：Yes
100	Feedback Packet Error	Add 1 time when the received packet command from drive is undefined. Only supports serial M3.

9.2 Unshared J Variables

- Supporting device：Axis, Spindle, SerialPLC, ROT, ATC.
- Definition of variables after J201 can be defined by each device.

Axis   Spindle   SerialPLC   ROT   ATC

No.	Name	Description
201	Spike compensation state	-1～1 -1：Disabled 0：Position Spike Compensation 1：Speed Spike Compensation
202	Whether torque feedforward compensation is supported by each axis	LONG 0：Not supporting 1：Supporting 2：Unsure
203	Whether torque feedforward compensation state is learned	BOOL FALSE：Unlearned TRUE：Learned
230	The times of insufficient interpolation data accessing space	INT Unit：Times
265	Whether speed feedfoward compensation is supported by each axis	LONG 0：Not supporting 1：Supporting 2：Unsure
266	Pitch compensation distance	Unit：IU (mm or in)
267	Pitch compensation home	Determine the starting number of home in pitch compensation chart
268	Whether each axis is the hidden axis	0：No 1：Yes
269	Axis home searching state	0：Not set 1：Set 2：Home error 3：Running home searching

No.	Name	Description
271	The time from each axis drive receiving the command to sending the command to motor	DOUBLE Unit：us
272	The time gap between each axis drive feedback data and interrupting signal	DOUBLE Unit：us

J variable applying example：

<DisplaySource>J3,Ax2</DisplaySource>

J_：number represents the variable of axis state

Ax_：represent the axis number (Ax1：1st axis, Ax2：2nd axis…)

Axis　　Spindle　　SerialPLC　　ROT　　ATC

coming soon

Axis　　Spindle　　SerialPLC　　ROT　　ATC

coming soon

Axis　　Spindle　　SerialPLC　　ROT　　ATC

coming soon

Axis　　Spindle　　SerialPLC　　ROT　　ATC

No.	Name	Description
201	Axis Mode	LONG 0: Auto Mode 1: MPG Mode 2: Debug Mode 3: Home Searching Mode

No.	Name	Description
202	Axis Executing	BOOL TRUE: Yes FALSE: No
203	Axis Alarm	BOOL TRUE: Yes FALSE: No
204	Axis Ready	BOOL TRUE: Yes FALSE: No
205	Axis Zero Position Arriving	BOOL TRUE: Yes FALSE: No
206	Axis Home Setting Complete	BOOL TRUE: Yes FALSE: No
207	Tool Pre-unclamp Position	DOUBLE Unit：deg
208	Tool Pre-clamp Position	DOUBLE Unit：deg

10 VAR/STR variables

10.1 Resources define

STR		VAR	
number	description	number	description
		1~50	user data
1~100	system reserved	51~100	system reserved
101~200	NcEditor reserved	101~200	NcEditor reserved
201~230	Syntec worksheet reserved		
231~1000	system reserved	201~1000	system reserved

10.2 Variables

STR	
number	description
1-100	System Reserved
101-160	NcEditor Argument Temporary Storage
161-180	NcEditor Reserved
181	NcEditor Command Name Temporary Storage
182	NcEditor File Source Storage
183-186	NcEditor Search and Replace Storage
187-200	NcEditor Reserved
201-230	WorkSheet Reserved
231-1000	System Reserved

VAR	
number	description
1-50	User defined area
51-100	System Reserved
101-160	NcEditor Argument Temporary Storage
161-180	NcEditor Reserved
181-184	NcEditor Reserved
185	NcEditor Focus Line No.
186	NcEditor Focus Line Skip Status
200-799	System Reserved
800-1000	User defined area

Note

1. VAR1-50 User defined area: please make sure VAR status and reset to correct value before using.
2. Expanded to1000 after 10.118.29V, 10.118.38