一、PLC application

1、PLC named：pls from the CNC controller derived data to U flash,the PLC.LAD is as the controller application PLC file.

2、Pls running our company specialized PLC edit program NEW-PLC.EXE, and call PLC.LAD to edit , after editing, pls save ladder diagram and command table.

3、1000T/M system I/O Port（total 56x32 point）：

导　　　　　　　　出　　　　　　　参　　　　　　　数

手动　连续				N00000		2011-06-16　19:26	

```
─────────── 输　入　点 ───────────          当前程序 │MILL
  0    0    0    0    0    0    0    0       指令代码
 X00  X01  X02  X03  X04  X05  X06  X07     ┌────────────────────────
 T01  T02  T03  T04  T05  T06  T07  T08     │G53
  0    0    0    0    0    0    0    0       │        T03H0D0
 X08  X09  X10  X11  X12  X13  X14  X15      机床状态
M34/A0 -L   +L  M36/Y0 X0  Z0  KRUN KHALT   ┌────────────────────────
  0    0    1    0    0    0    0    0       │M05    M09      M10
 X16  X17  X18  X19  X20  X21  X22  X23      │M78    M33      M70
 XZ0  ZZ0  KLEFT KRIGHT STOP TOK  ALM  ALM1 
  0    0    0    0    0    0    0    0          G00    X100%
 X24  X25  X26  X27  X28  X29  X30  X31        F250   X100%
ALM2 M28  M24  M22  M18  M12  M14  M16         S800   X100%
  1    1    1    1    1    1    1    1       机床坐标
 X32  X33  X34  X35  X36  X37  X38  X39     ┌────────────────────────
 HX   HY   HZ   HA   HX1 HX10 HX100 HOFF    │ X    100.000
  0    0    0    0    0    0    0    0       │ Y     20.000
 X40  X41  X42  X43  X44  X45  X46  X47     │ Z     50.000
  1    1    1    1    1    1    1    1       单件时间 │0:2
 X60  X61  X62  X63  X64  X65  X66  X67     加工件数 │0
 DS3  DS2  DS1  DS0  DK3  DK2  DK1  DK0      主轴转速 │0

        机床状态：正常
```

	I/O		报　警		复位驱动		返　回

Note:

    1）、X32-X39、X60-X67 as normal close, also internalis +5V power, pls do not connect more than +5V voltage; others is as normal open。

    2）、All of input output 0 V is available

    3）、Pls pay more attention the function can not same as previous PLC and controller to reusage

```
手动  连续                          N00000          2011-06-16  19:27
─────────────── 输  出  点 ───────────────
  0       0       0       0       0       0       0       0
 Y00     Y01     Y02     Y03     Y04     Y05     Y06     Y07
 M61     M63     M65     M67     M69     M71     M73     M59
  0       0       0       0       0       0       0       0
 Y08     Y09     Y10     Y11     Y12     Y13     Y14     Y15
 M32     M79     M10     M08     M05     M04     M03     M75
  0       0       0       0       0       0       0       0
 Y16     Y17     Y18     Y19     Y20     Y21     Y22     Y23
 LRUN   INTH     +T      -T     S04     S03     S02     S01
  0       0       0       0       0       0       0       0
 Y24     Y25     Y26     Y27     Y28     Y29     Y30     Y31
```

当前程序 | MILL
指令代码
G53
        T03H0D0
机床状态
M05   M09   M10
M78   M33   M70
  G00   X100%
  F250   X100%
  S800   X100%
机床坐标
  X   100.000
  Y   20.000
  Z   50.000
单件时间 | 0:2
加工件数 | 0
主轴转速 | 0

机床状态：正常

[   ] [I/O] [   ] [报 警] [   ] [复位驱动] [   ] [返 回]

二、PLC internal assistant relay

Definition of lathes and machining centers internal auxiliary relays：

	No	Name (Function)	Description
1	M00	Feed ban	Each axis feed ban when the relay valid
2	M01	Manual states	State relay, when the system is in manual mode this relay is valid, on the contrary is void when this relay system will be in automatic mode
3	M02	Just started	State relay, when the system has just started and remain valid for this relay.
4	M03	Prohibit procedures	When the effective prohibition of the relay run automatically
5	M04	Emergency stop	When the system is in the emergency stop relay valid state.
6	M05	tool in selecting	State relay, when the system is selected cutter (cutter rotation) state of this relay is valid.
7	M06	tool in changing	State relay, when the system is a tool change (tool change) the status of this relay is valid.
8	M07	Magazine back	When the relay system to perform effectively

		to zero	magazine zeroing
9	M08	Feeding running	State relay, when the system axis feed this relay is valid.
10	M09	Backup	
11	M10	Protective door open	When the relay system is an effective protective door open
12	M11	Backup	
13	M12	Machine abnormal	State relays, emergency stop or drive when the system alarm or custom alarm relays or hard limit this effect.
14	M13	backup	Clamp test
15	M14	Spindle orientation	When the relay system to perform spindle orientation function effectively. (Output
16	M15	Clamp detection	When the relay is valid , it means chuck is in clamp situation
17	M16	X+ limit	It means X-axis in the positive limit state when the relay is valid. (Input)
18	M17	X- limit	It means X-axis in the negative limit state when the relay is valid. (Input)
19	M18	Y+ limit	It means Y-axis in the positive hardware limit state when the relay is valid. (Input)
20	M19	Y- limit	It means Y-axis in the negative limit state when the relay is valid. (Input)
21	M20	Z+ limit	It means Z-axis in the positive limit state when the relay is valid. (Input)
22	M21	Z- limit	It means Z-axis in the negative limit state when the relay is valid. (Input)
23	M22	A+ limit	A shaft is in said forward limit state when the relay is valid. (Input)
24	M23	A- limit	A shaft is negative indicates limit state when the relay is valid. (Input)
25	M24	B+ limit	A shaft is negative indicates a hard limit state when the relay is valid. (Input), said B-axis in the positive limit state when the relay is valid. (Input)
26	M25	B- limit	It means B-axis in the negative limit state when the relay is valid. (Input)
27	M26	C+ limit	It means C-axis in the positive limit state when the relay is valid. (Input)
28	M27	C- limit	It means C-axis in the negative limit state when the relay is valid. (Input)
29	M28	Backup	
30	M29	Backup	

31	M30	Forward positioning	When the relay is valid , it means finial forward is in position
32	M31	Back Positioning	When the relay is valid , it means finial back is in position
33	M32	X driver alarm	X-axis indicates the drive is in an alarm state when the relay is valid. (Input)
34	M33	Y driver alarm	Y-axis indicates the drive is in an alarm state when the relay is valid. (Input)
35	M34	Z driver alarm	Said Z-axis drive is in an alarm state when the relay is valid. (Input)
36	M35	A driver alarm	A drive shaft, said in an alarm state when the relay is valid. (Input)
37	M36	B driver alarm	B-axis indicates the drive is in an alarm state when the relay is valid. (Input)
38	M37	C driver alarm	C-axis indicates the drive is in an alarm state when the relay is valid. (Input)
39	M38	After running ()	During automatic operation, when the relay effective program block "()" will be performed within the otherwise contrary. (Input)
40	M39	Spindle alarm	Said spindle drive in an alarm state when the relay is valid. (Input)
41	M40	Detection of high-grade spindle	Expressed in high-grade spindle when the relay state is valid. (Input)
42	M41	Spindle low detection	Said spindle is low state when the relay is valid. (Input)
43	M42	Loose knife detection	Said cutter knife in loose state when the relay is valid. (Input)
44	M43	Spindle back to zero	Said spindle is executed back to zero when the action is completed state relay valid. (Input)
45	M44	Cooling overload	Said machine tool cooling motor is overload alarm status when the relay is valid. (Input)
46	M45	Lack of liquid cooling	Means that when the relay is the lack of an effective tool coolant fluid (liquid enough) alarm status. (Input)
47	M46	Lubrication overload	Said machine lubricated motor is overload alarm status when the relay is valid. (Input)
48	M47	Lubrication starvation alarm	Said machine is short of oil lubricants (oil level is not enough) alarm status when the relay is valid. (Input)
49	M48	Cooling	When the relay efficient cooling system to

			perform open action. (Output, which can be controlled with a command M08/M09 valid / invalid)
50	M49	Chuck elastic	When the relay system to perform effective tool loose action. (Output, which can be controlled valid / invalid by a command M10/M11)
51	M50	Blowing	When the relay when the system is running effectively blowing action. (Output, which can be controlled with a command M24/M25 valid / invalid)
52	M51	Lubricating	When the relay is active lubrication system to perform the action. (Output, which can be controlled with a command M32/M33 valid / invalid
53	M52	User-defined	When the relay is active the system performs the appropriate action by the PLC. (Output, with instruction M57 / M58 can control the valid / invalid
54	M53	Spindle Forward	When the relay is active spindle rotation system to perform the action. (Output, with instructions M03/M04, M05 can control the valid / invalid)
55	M54	Spindle reverse	When the relay system to perform effectively reversing the spindle movement. (Output, with instructions M04/M03, M05 can control the valid / invalid)
56	M55	Spindle stop	When the relay system to perform effectively reversing the spindle movement. (Output, with instructions M05/M03, M04 can control the valid / invalid)
57	M56	User-defined	When the relay is active the system performs the appropriate action by the PLC. (Output, with instruction M41 / M42 can control the active / inactive, when the magazine PLC control system defaults to the knife forward (Armless library) / pocket down (rotary magazine) Control)
58	M57	User-defined	When the relay is active the system performs the appropriate action by the PLC. (Output, with instruction M43 / M44 can control the active / inactive, when the magazine PLC control system defaults to the knife back (Armless library) / pocket Lift (rotary

			magazine) Control)
59	M58	User-defined	When the relay is active the system performs the appropriate action by the PLC. (Output, with instruction M45 / M46 can control the valid / invalid)
60	M59	User-defined	When the relay is active the system performs the appropriate action by the PLC. (Output, with instruction M47 / M48 can control the valid / invalid)
61	M60	User-defined	When the relay is active the system performs the appropriate action by the PLC. (Output, with instruction M49 / M50 can control the valid / invalid)
62	M61	User-defined	When the relay is active the system performs the appropriate action by the PLC. (Output, with instruction M51 / M52 can control the valid / invalid)
63	M62	User-defined	When the relay is active the system performs the appropriate action by the PLC. (Output, with instruction M53 / M54 can control the valid / invalid)
64	M63	User-defined	When the relay is active the system performs the appropriate action by the PLC. (Output, with instruction M55 / M56 can control the valid / invalid)
65	M64	Spindle high gear	When the relay when the system performs efficiently spindle upshift action. (Output)
66	M65	Spindle low gear	When the relay when the system performs efficiently spindle downshift action. (Output)
67	M66	Spindle servo	When the relay switch in place an effective system to perform the spindle servo (position control) system mode. (Output)
68	M67	Spindle lock	When the relay is active spindle drive control system allows the spindle motor in the power-lock status. (Output)
69	M68	Spindle back to zero	When the relay is active spindle system performs the action back to zero. (Output)
70	M69	Speed in place	This effectively means that when the relay command rpm spindle speed reaches the actual speed. (Input)
71	M70-M79	backup	When the relay is active the system performs the appropriate action by the PLC. (Input / output)

72	M80	Tool Motor over load alarm	When the relay is in valid , it means motor with tool is in over load alarm sate
73	M81	hydraulic motor over load alarm	When the relay is valid , indicate hydraulic motor is in over load alarm sate (input)
74	M82	hydraulic pressured alarm	When the relay is valid , indicate hydraulic pressured is not enough alarm sate (input)
75	M83	hydraulic block alarm	When the relay is valid , indicate hydraulic oil passage is in block alarm sate (input)
76	M84	Motor over load alarm	When the relay is valid , indicate motor is in over load alarm sate (input)
77	M85-M95	No 5-15 user-defined alarm	When the relay is in valid, Press PLC on system prompt relative alarm message, if limit some move, it need edit PLC program to achieve (input)
78	M100	Tool no 0	Tool no (5-digit binary value code , 0-63)
79	M101	Tool no 1	
80	M102	Tool no 2	
81	M103	Tool no 3	
82	M104	Tool no 4	
83	M105	backup	When the relay is active the system performs the appropriate action by the PLC. (Input / output)
84	M107-M109		
85	M110	Third gear output	When the relay system to perform effectively the third spindle gear change action. (Output)
86	M111	Four gear output	When the relay system to perform effectively spindle fourth gear change action. (Output)
87	M112	Third gear test	Said third gear shaft in the state when the relay is valid. (Input)
88	M113	Four gear test	Said spindle is the fourth tranche of the state when the relay is valid. (Input)
89	M114	Remote operation	When the relay to run the program effectively. (Input) with an external Run button.
90	M115	Remote stop	When the relay effectively stop the program. (Input) with an external stop button.
91	M120	Forward magazine	When the relay system to perform effectively magazine forward movement. (Output
92	M121	Magazine reversal	When the relay system to perform effectively magazine reversal action. (Output)

93	M122	The program runs	State relay, then this means that the system is effective relay automatically running.
94	M123	The program pause	State relay, the relay was effectively suspended state indicates that the system is in Program。
95	M124	Spindle speed gear 0	Spindle gear 4 compiled binary code output value, the corresponding command S0-S15.
96	M125	Spindle speed gear 1	
97	M126	Spindle speed gear 2	
98	M127	Spindle speed gear 3	
99	M128	Prohibit X axis	X-axis movement is prohibited when the relay is valid. (Input)
100	M129	Prohibit Y axis	Y-axis movement is prohibited when the relay is valid. (Input)
101	M130	Prohibit Z axis	Z-axis movement is prohibited when the relay is valid. (Input)
102	M131	Prohibit A axis	A-axis movement is prohibited when the relay is valid. (Input)
103	M132	Prohibit B axis	B-axis movement is prohibited when the relay is valid. (Input)
104	M133	Prohibit C axis	C-axis movement is prohibited when the relay is valid. (Input)
105	M134	Backup	When the relay is active the system performs the appropriate action by the PLC. (Input / output)
106	M135	Backup	
107	M151-M198	Backup	X151-X198 relay relay last saved state.
108	M200	Running state	X axis forward run
109	M201	Running state	X axis negative Run
110	M202	Running state	Y axis forward run
111	M203	Running state	Y axis negative Run
112	M204	Running state	Z axis forward run
113	M205	Running state	Z axis negative Run

114	M206	Running state	A axis forward run
115	M207	Running state	A axis negative Run
116	M208	Running state	B axis forward run
117	M209	Running state	B axis negative Run
118	M210	Running state	C axis forward run
119	M211	Running state	C axis negative Run
120	M212	Back to the zero state	X-axis has returned zero state
121	M213	Back to the zero state	Y-axis has returned zero state
122	M214	Back to the zero state	Z-axis has returned zero state
123	M215	Back to the zero state	A-axis has returned zero state
124	M266	Equivalent X182	Milling-X key
125	M267	Equivalent X180	Milling +X key
126	M268	Equivalent X179	Milling -Y key
127	M269	Equivalent X178	Milling +Z key
128	M270	Equivalent X177	Milling +4 key
129	M271	Equivalent X183	Milling +Y key
130	M272	Equivalent X184	Milling -Z key
131	M273	Equivalent X185	Milling -4 key
132	M274	Equivalent X181	milling fast overlay key
133	M250--M265	Internal system backup	M265 valid table just press the reset button, passed by the NC layer to the PLC layer needs to be reset by the PLC itself the auxiliary relay。

134	M266--M281	Internal system backup	
135	M250	System takes	Chuck M10M11 short signal timing used.
136	M251	System takes	Top M51M53 short signal timing used
137	M266--M274	System takes	Manual input for external signal。
138	M275:	System takes	Resolving power wire spindle rigidity ratio of two to one problem.
139	M276	System takes	Follow signs currently in tapping state.
140	M277	System takes	When it is valid to implementation of a user-defined control program
141	M278:	System takes	When it is valid to implementation of Z axis gap setting function
142	M218--M233	Internal system backup	
143	M234--M249	Internal system backup	
144	M218	System takes	Use with M219.
145	M219	System takes	Tight knife instruction execution M10 becomes active, the instruction execution loose knife M11 becomes invalid.
146	M220	System takes	Running open
147	M221	System takes	Accessibility MST locked
148	M222	System takes	System +5 V power supply is low.
149	M223	System takes	+24 V power supply system is low.
150	M282--M297	User-defined	When the relay is active the system performs the appropriate action by the PLC. (Input / output)
151	M298--M313	User-defined	When the relay is active the system performs the appropriate action by the PLC. (Input / Output))
152	M171/X172	K1	K1 last state
153	M172/X172	K2	K2 last state
154	M173/X173	K3	K3 last state
155	Y78	K1 light	
156	Y77	K2 light	
157	Y76	K3 light	
	M265		Reset Relay