

UMC4



使用手册

Version: 2023-01-10

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第一章 产品简介

1.1 产品介绍

UMC4 是 USB 界面的全数字高性能激光打标专用卡。支持数字振镜，兼容于 XY2-100 传输规格，透过 DA2-16 子卡可精密控制模拟振镜。UMC4 内建完整的脱机雕刻功能，可存取 16 个档案，每个档案有 8 组自动文字及 8 组字型，并可透过 I/O 选择档案及雕刻、或是可以透过 PLC 控制。内建完整的旋转轴功能，以及飞行打标功能。另有多元化的子卡，除了有足够弹性与自动化设备连接外，对于需要额外接点的激光控制器，可以用最简单的接线方式控制。

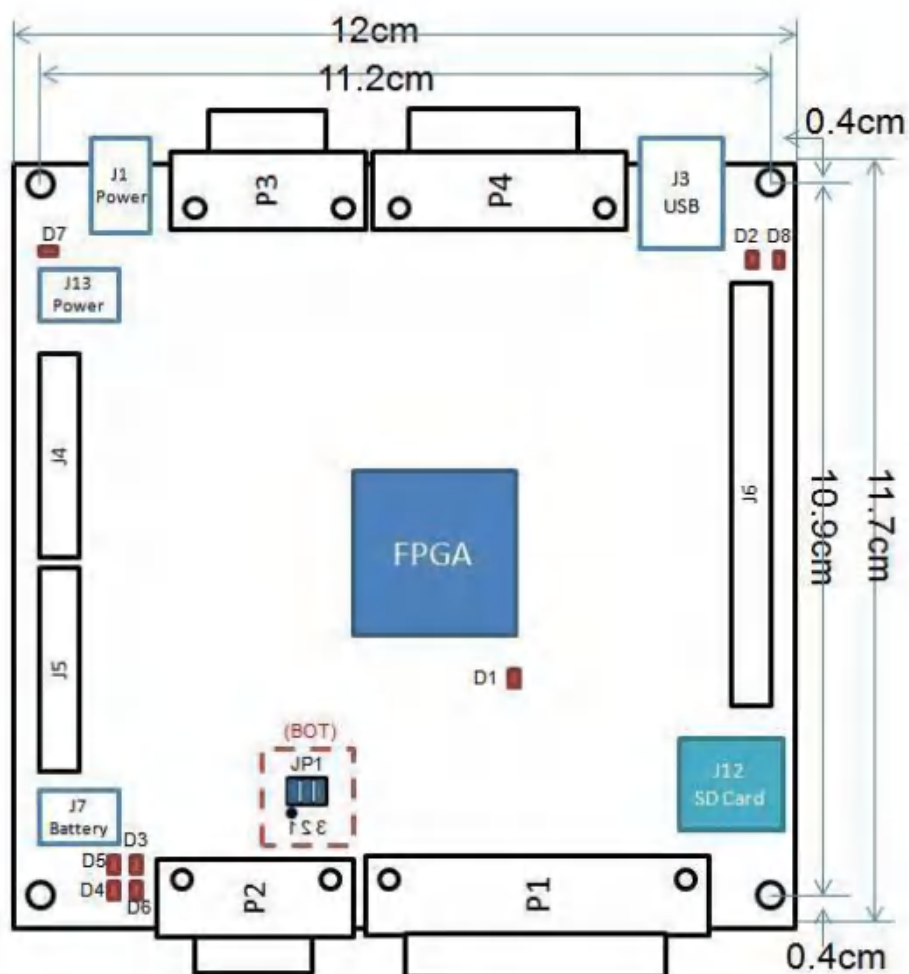
1.2 产品规格

- ◆ 内建 DSP，打标运算不占用计算机 CPU 时间
- ◆ 1 组 XY2-100 振镜数字讯号，振镜位置更新周期 $10\mu s$
- ◆ FPK, PPK, R05 首脉冲抑制
- ◆ 12 位模拟控制信号 x2
- ◆ PWM 最高输出频率 10MHz，PWM 最小脉冲宽度 $0.08\mu s$
- ◆ 脱机雕刻，可存取 16 组档案，每个档案有 8 组自动文字及 8 组字型
- ◆ 1 组 RS232 通讯端口，可以和 PLC 通讯。(三菱 FX2)
- ◆ 支持 1 轴编码器输入，可执行飞行打标功能
- ◆ 可输出 1 轴脉波/方向数字轴控讯号，输出最高频率 2MHz
- ◆ 特定扩充接口，可以和多元化子卡并联
- ◆ 支援 Windows XP / 2000 / Vista / Windows 7 / Windows 8

1.3 产品外观



1.4 Layout图

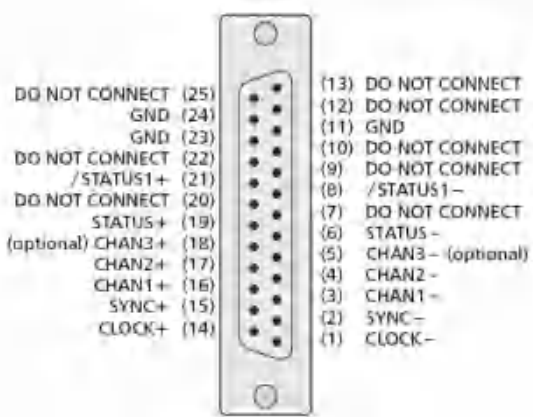


名 称	用 途	说 明	
P1	Scan head	主要雕刻头接口(D-SUB 25-Pin 母座)	
P2	Laser Connector	激光控制与模拟输出接口(D-SUB 15-Pin 3 排母座) P3	
P3	RS232	PLC 控制端口(D-SUB 9-Pin 母座)	
P4	I/O Connector	旋转轴、编码器及其它I/O 接口(D-SUB 26-Pin 3 排母座)	
J1、J13	Power	DC +5V 3A 电源输入接口	
J3	USB	USB 接口	
J4~J6	Expansion Connector	子卡连接扩充接口	
J7	Battery Connector	Date 定时器外接电池接口(+1.5V~+5V 输入) J1	
J12	SD Card	SD Card 接口	
D1~D8	LED 显示	显示UMC4 状态灯号	
JP1 (背面)	FPK / R05 选择	1、2 短路为FPK	2、3 短路为R05

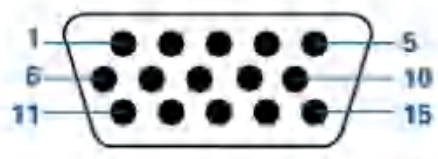
注：J4, J5, J6 子卡连接扩充接口，请勿接线，否则会导致板子无法修复

第二章 脚位配置

2.1 激光控制脚位

25-pin 母座脚位	脚位	脚位说明
 DO NOT CONNECT (25) GND (24) GND (23) DO NOT CONNECT (22) /STATUS1+ (21) DO NOT CONNECT (20) STATUS+ (19) (optional) CHAN3+ (18) CHAN2+ (17) CHAN1+ (16) SYNC+ (15) CLOCK+ (14) (13) DO NOT CONNECT (12) DO NOT CONNECT (11) GND (10) DO NOT CONNECT (9) DO NOT CONNECT (8) /STATUS1- (7) DO NOT CONNECT (6) STATUS- (5) CHAN3- (optional) (4) CHAN2- (3) CHAN1- (2) SYNC- (1) CLOCK-	1, 14	Differential Out (CLOCK)
	2, 15	Differential Out (SYNC)
	3, 16	Differential Out (CHAN1)
	4, 17	Differential Out (CHAN2)
	5, 18	Differential Out (CHAN3)
	6, 19	Differential In (STATUS)
	8, 21	Differential In (/STATUS)
	11, 23, 24	GND

2.2 P2 (LASER_CONNECTOR): 激光控制接口

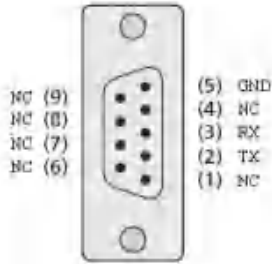
15-pin 母座脚位图	脚位	脚位说明
	1	Analog Out1
	2	Analog Out2
	3	GND2 [2]
	4	Laser1 (PWM) 频率调变讯号[1]
	5	Laser2 (FPK) or R05房奴脉冲抑制讯号
	6	L0 (Laser On/Off)
	7	L1 (Leading Light On/Off)
	8	L2 (Shutter)
	9	L3 (CW select)
	10	L4 (Lamp On/Off)
	11	L5 (启动省电模式)
	12	/START为输入干接点(与 Pin15 短路即可触 动 START)
	13	/STOP 为输入干接点(与 Pin15 短路即可触 动 STOP)
	14	DC±15V 1A (输出)
	15	GND

注：[1] Laser1和Laser2的输出讯号依选用的激光模式不同而不同。请参阅下表及附录一说明

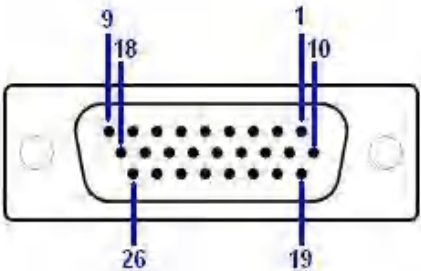
[2] GND为数字的地，GND2为模拟的地。若无需区分，则两者并无分别

	CO ₂ Mode	YAG Mode	RO5
Laser1	Modulation Pulse 1	Q-Switch signal	Q-Switch signal
Laser2	Modulation Pulse 2	First Pulse Killer	Analog out R05

2.3 P3 (RS232): PLC通讯端口接口

9-pin 脚位图	脚位	脚位说明
	2	TX
	3	RX
	5	GND

2.4 P4 (I/O CONNECTOR): 轴控、编码器及I/O接口

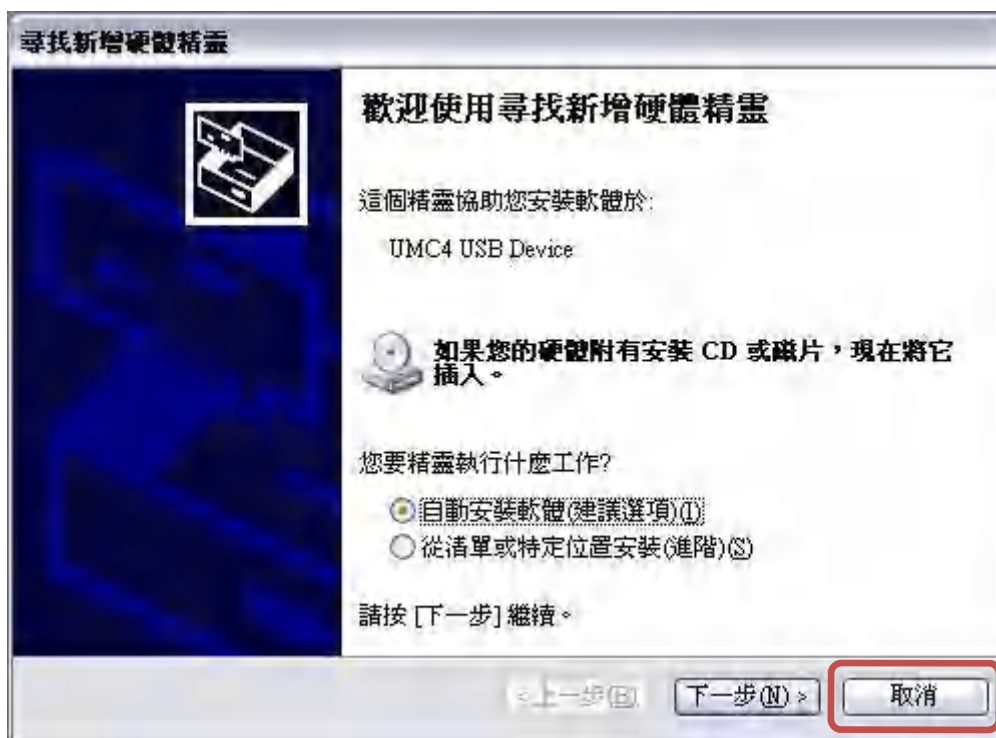
15-pin 母座脚位图	脚位		脚位说明	
	1	11	Encoder A+	Encoder A-
	2	12	Encoder B+	Encoder B-
	3	13	Pulse+	Pulse-
	4	14	Direction+	Direction-
	5	15	Home+	Home-
	6、10		DC: +5V 1A(输出)	
	7		OPTO IN5: Shut Down	
	8		/START 预设干接点(与Pin18 短路即可触动)	
	9		/STOP 预设干接点(与Pin18 短路即可触动)	
	16		OPTO IN1 档案选择输入点	
	17		OPTO IN2 档案选择输入点	
	25		OPTO IN3 档案选择输入点 / Limit-	
	26		OPTO IN4 档案选择输入点 / Limit+	
	18		GND	
	19		OPTO V+: 5 ~ 24V 输入	
	20		OPTO OUT1: Program Ready	
	21		OPTO OUT2: Marking Ready	
	22		OPTO OUT3: Marking End	
	23		OPTO OUT4: Error	
	24		OPTO GND: 0V 输入(与GND 开路)	

第三章 安装及配接线

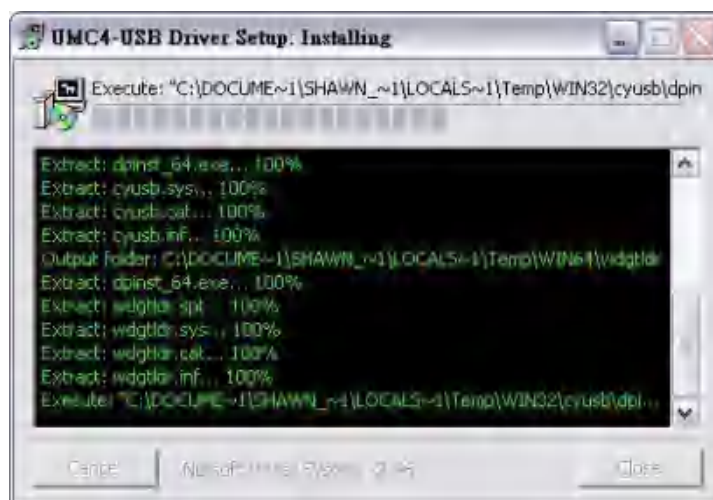
3.1 UMC4安装

3.1.1 情况1：假如您电脑尚未安装过MM-SA，请先安装MM-SA

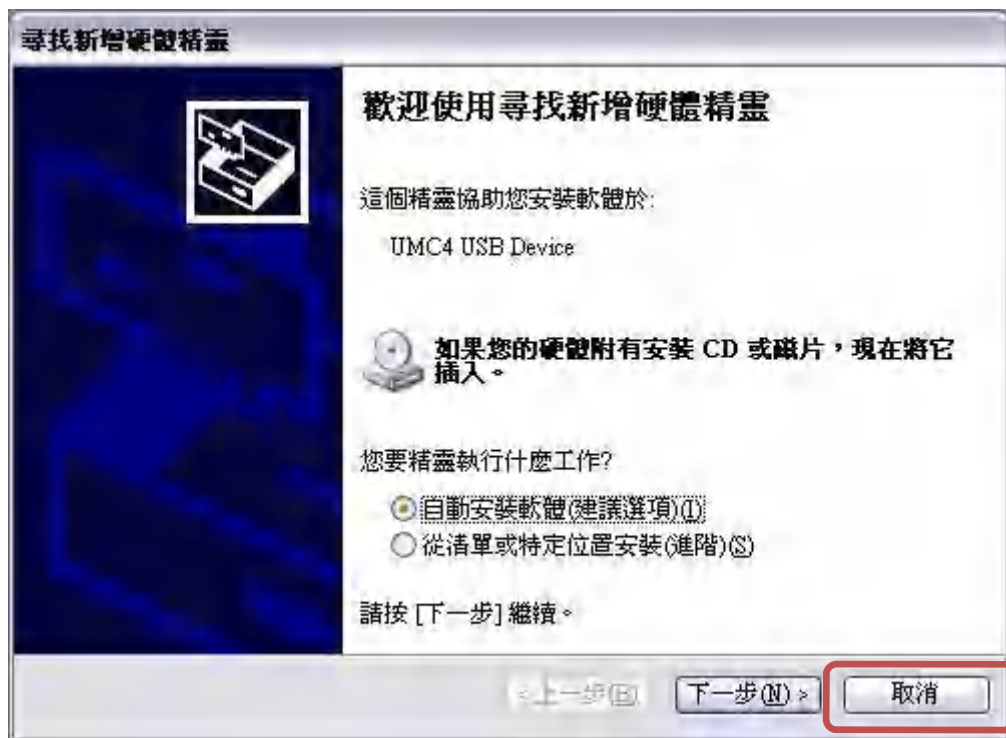
安装前请先将 UMC4 连接至计算机，UMC4 连接后会跳出「寻找新增硬件精灵」，请按取消。



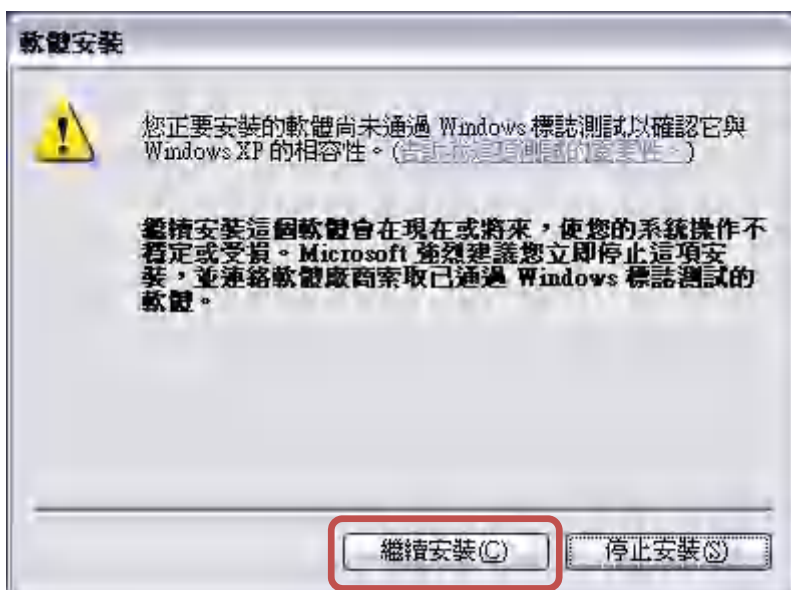
安装 MM-SA 安装过程中，系统会自动执行「UMC4-USB Driver Setup」，



当 UMC4-USB Driver Setup 安装时，会跳出「寻找新增硬件精灵」，请按「取消」



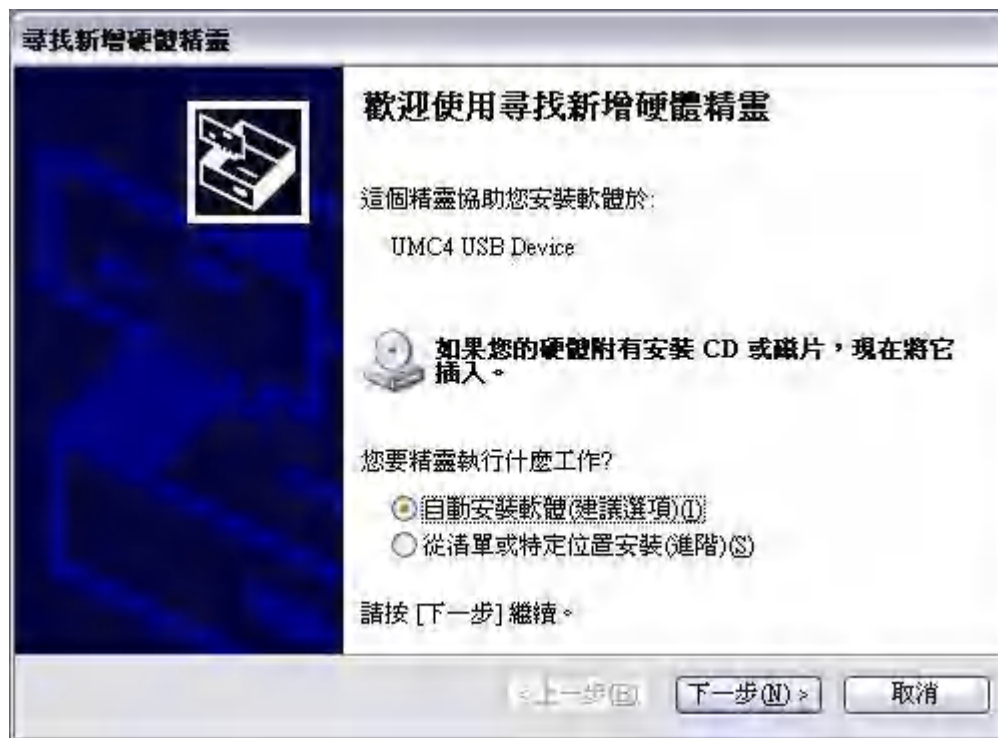
当 UMC4-USB Driver Setup 安装时，会跳出「软件安装」，请选择「继续安装(C)」，总计会跳出 3 次。



「UMC4-USB Driver Setup」安裝完成后，您即可使用 UMC4。

3.1.2 情况2：假如您的电脑已安装过MM-SA

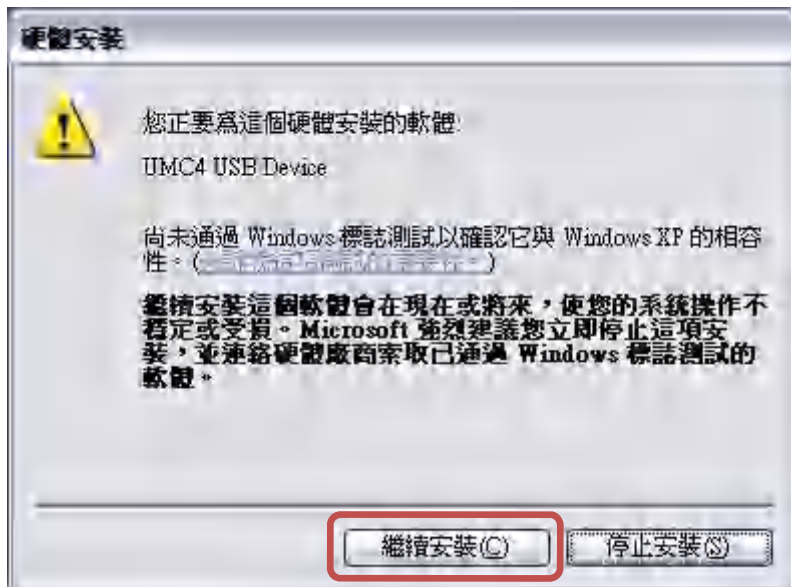
连接 UMC4 后，Windows 会启动「寻找新增硬件精灵」后，请按「下一步」



寻找新增硬件精灵会搜寻 Driver，



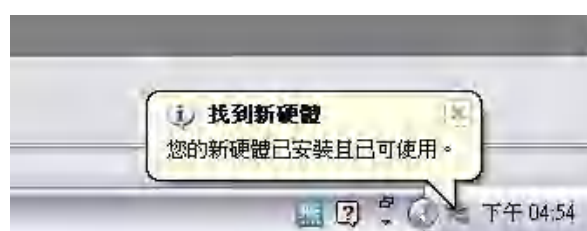
当「寻找新增硬件精灵」搜寻到 UMC4 Driver 后，会跳出「硬件安装」窗口，请选择「继续安装(C)」



当 Driver 安装完后，请在「寻找新增硬件精灵」窗口选择「完成」

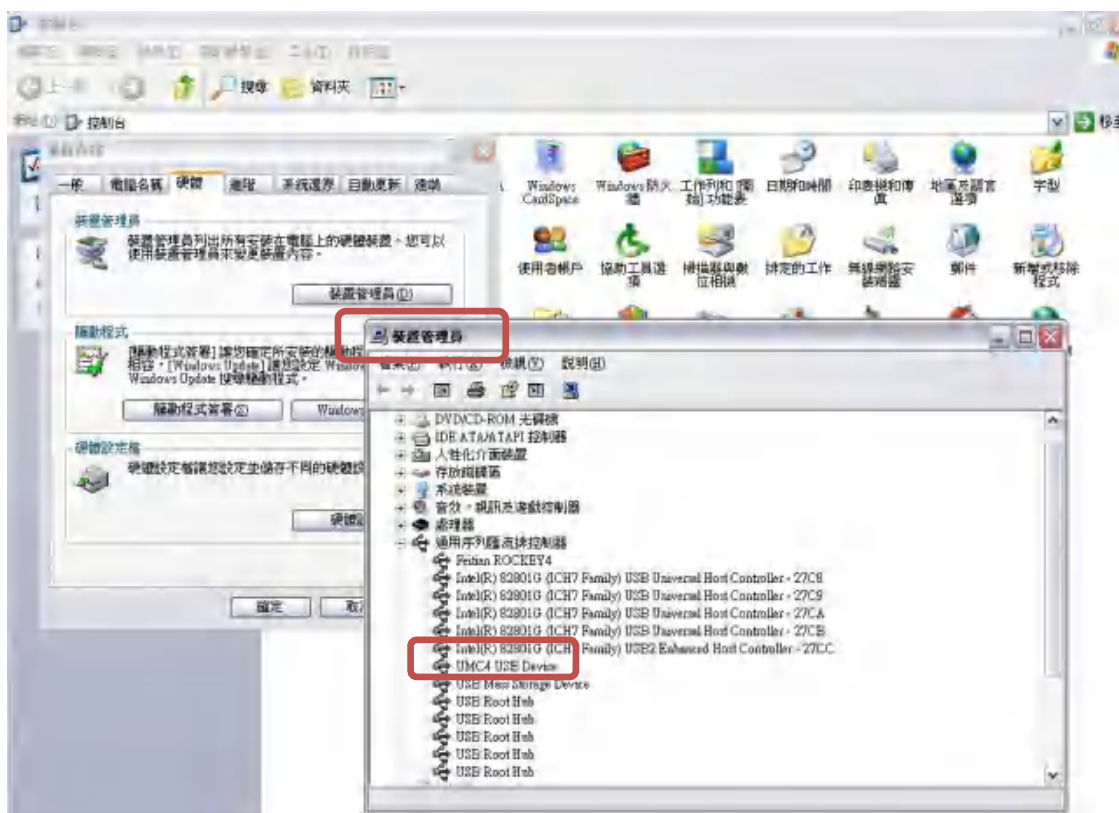


最后 Windows 左下方会跳出「找到新硬件 您的新硬件已安装且已可使用。」,之后您就可以正 常使用 UMC4。



3.1.3 如何确定UMC4是否正确安装？

若您已经正确安装 UMC4 卡，在设备管理器中，应可看到「UMC4 USB Device」的信息，如下图：



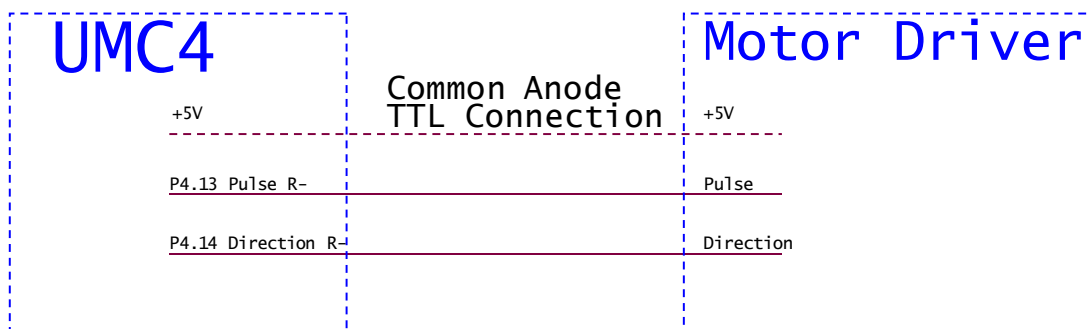
3.2 步进/伺服马达讯号配接

在 P4 接口上，连接旋转轴马达驱动器的 Pulse 与 Direction 讯号接脚，其与马达驱动器的接线 方式有下列三种，请依马达驱动器的规格配接。

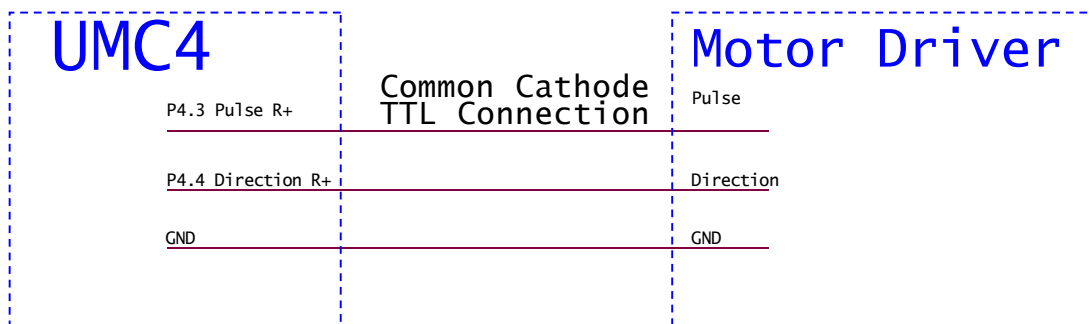
3.2.1 马达驱动器为差动讯号（Differential Signal）

UMC4	Different Signal Connection	Motor Driver
P4.3 Pulse R+		Pulse+
P4.13 Pulse R-		Pulse-
P4.4 Direction R+		Direction+
P4.14 Direction R-		Direction-

3.2.2 马达驱动器为TTL共阳 (Common Anode)

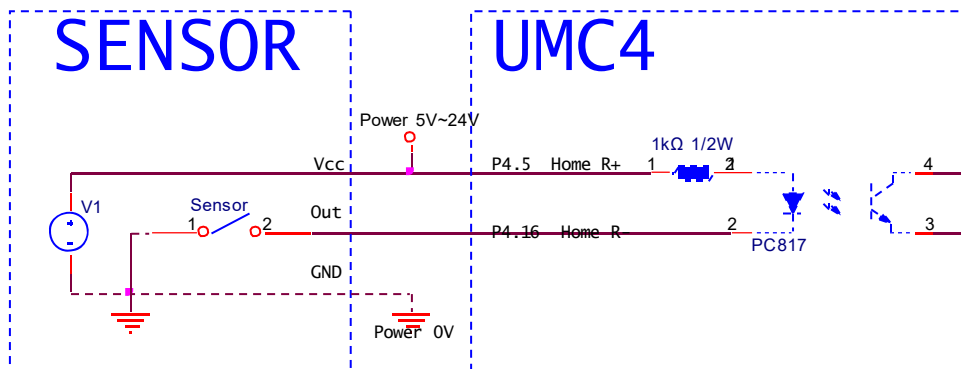


3.2.3 马达驱动器为TTL共阴 (Common Cathode)

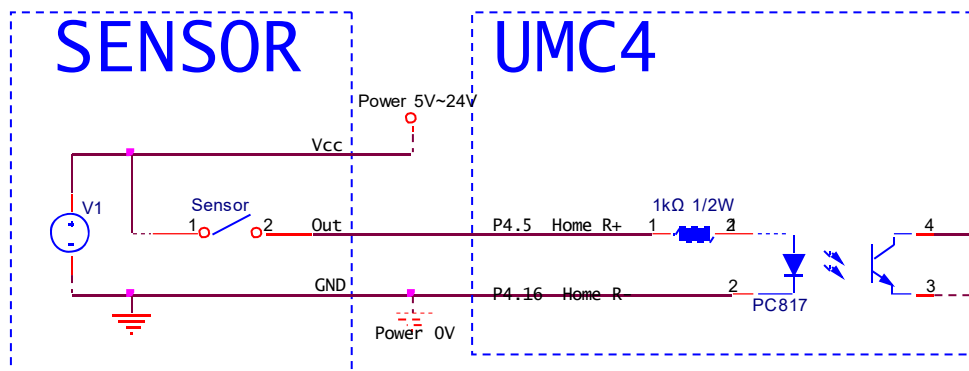


3.3 HOME点SENSOR配接

3.3.1 共阴型 Sensor (Common Cathode) (NPN型)

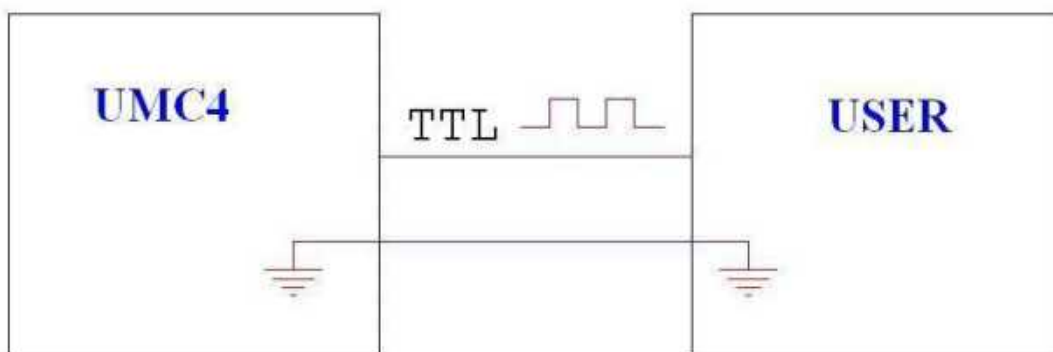


3.3.2 共阳型 Sensor (Common Anode) (PNP型)



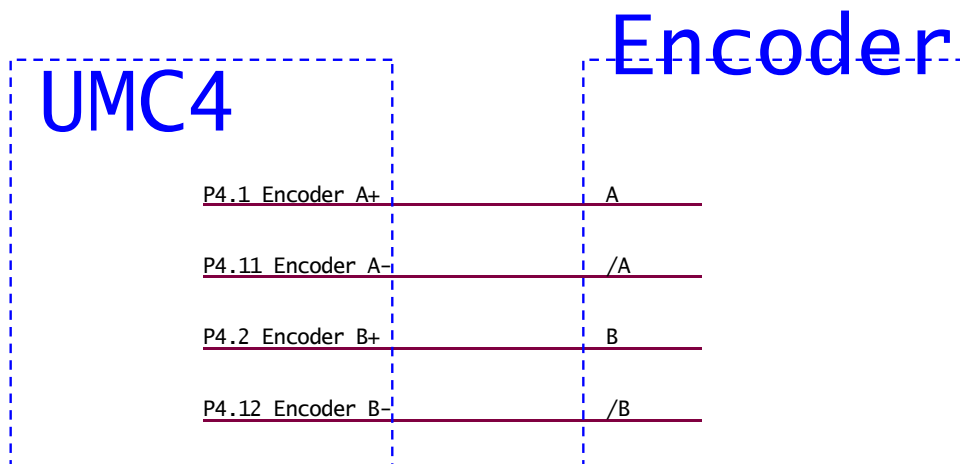
3.4 TTL 讯号配接

TTL 讯号为一对一连接，如下图：



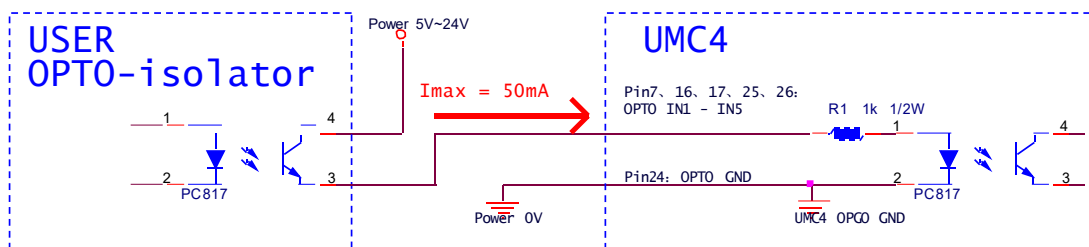
3.5 编码器讯号配接

编码器讯号配接方式，如下图：

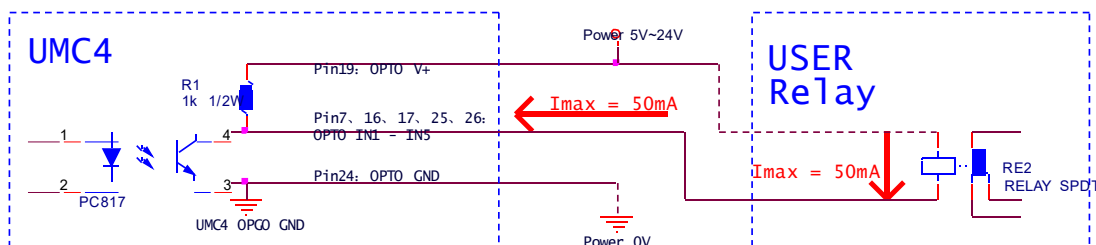


3.6 光耦合讯号配接

3.6.1 OPTO IN 配接



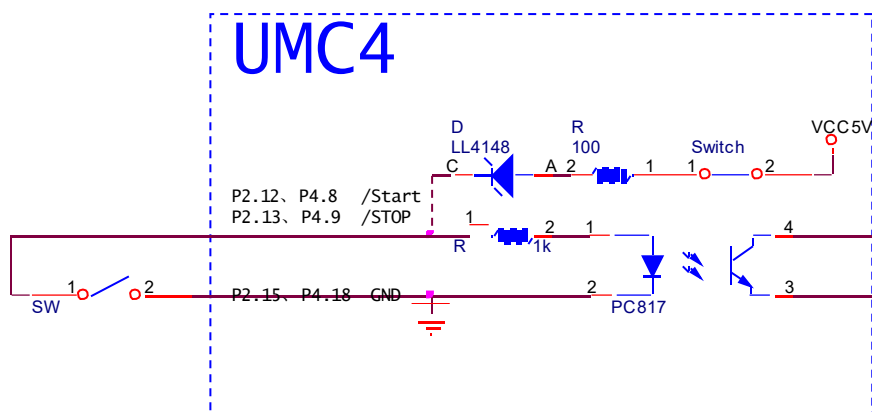
3.6.2 OPTO OUT 配接



注: PC817 Pin4→Pin3 最大只容许 50mA 的电流通过, 假如 USER Relay 需要电流大于 50mA, 请外加电流放大电路

3.7 START及STOP讯号配接

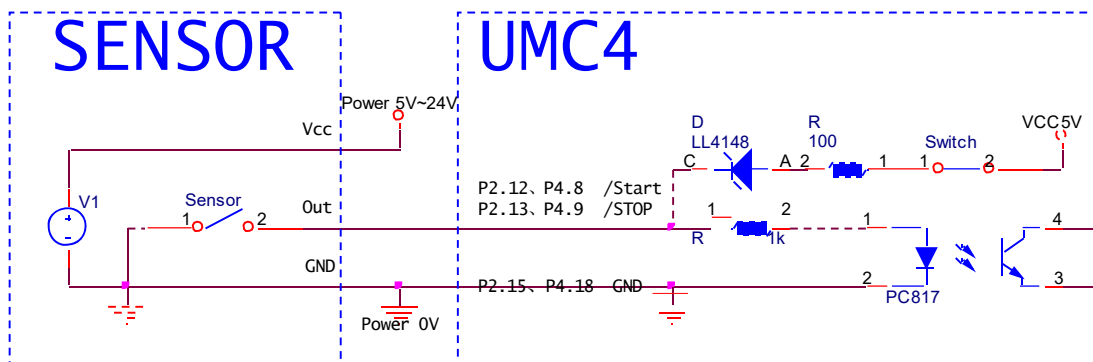
3.7.1 连接脚踏开关 (Button)



注: HWConfig 请设定成 Common Cathode, 设定方法请参考 [3-8 HWConfig 设定说明](#)。

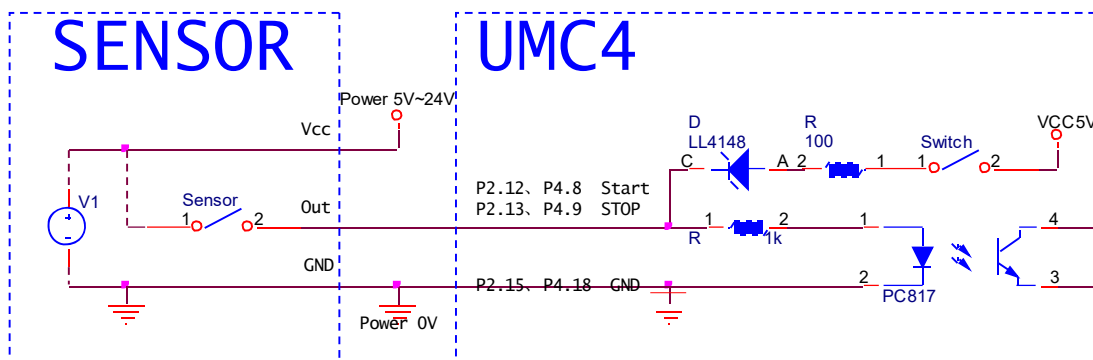
3.7.2 连接光电开关 (Sensor)

(1) 共阴型 Sensor (Common Cathode), 当遮断时 Sensor Output 会和 GND 短路



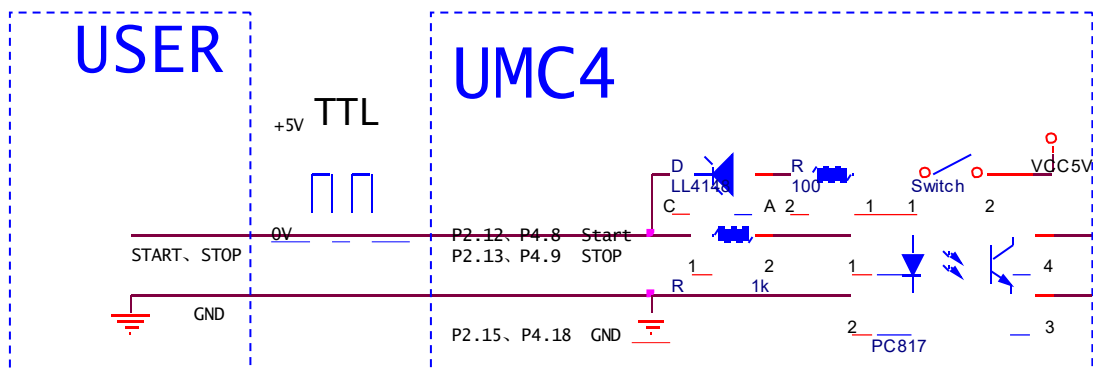
注：HWConfig 请设定成Common Cathode，设定方法请参考 [3-8 HWConfig 设定说明](#)。

(2) 共阳型 Sensor(Common Anode)，当遮断时 Sensor Output 会和 Vcc 短路



注：HWConfig 请设定成Common Anode，设定方法请参考 [3-8 HWConfig 设定说明](#)。

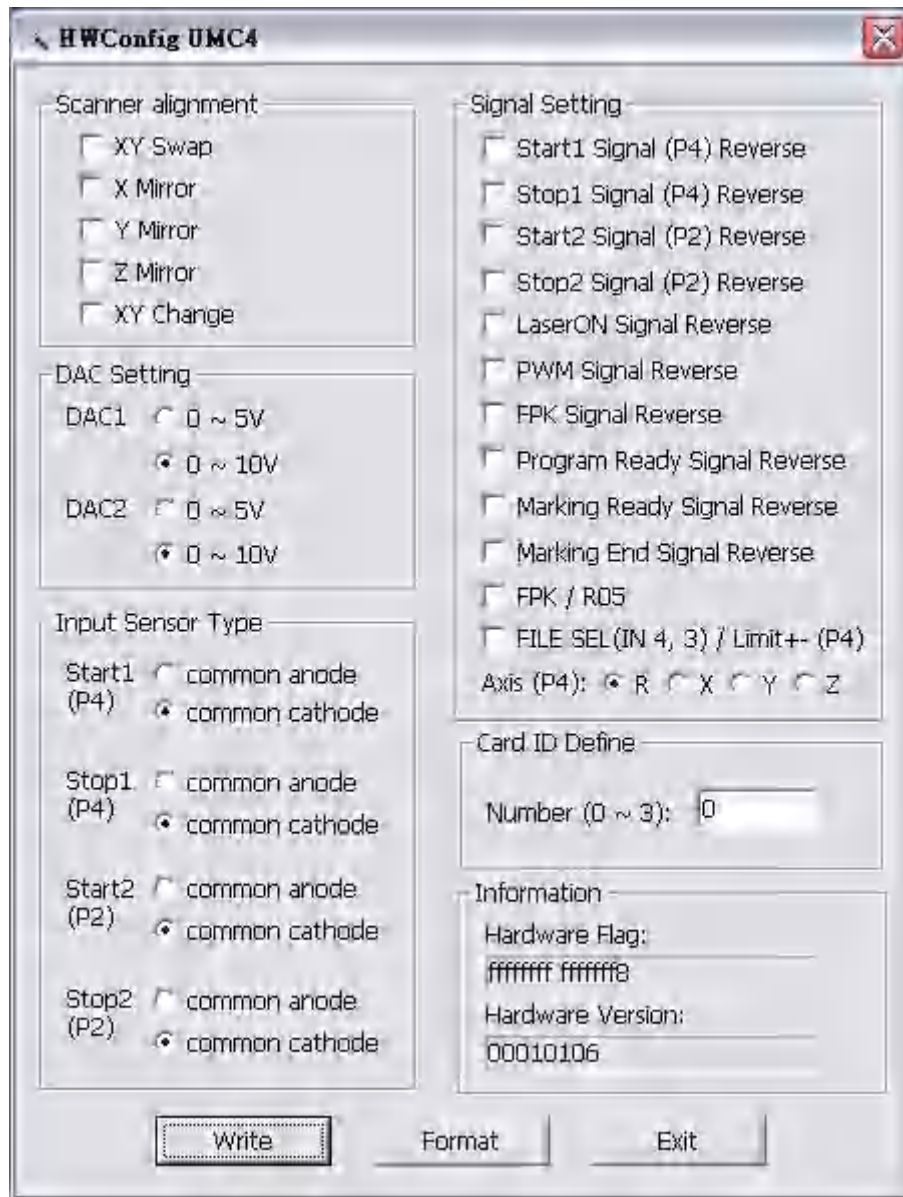
3.7.3 输入TTL讯号



注：HWConfig 请设定成Common Anode，设定方法请参考 [3-8 HWConfig 设定说明](#)。

3.8 HWConfig 设定说明

档案路径: C:\Program Files\MM-SA\Drivers\UMC4\HWConfig.exe



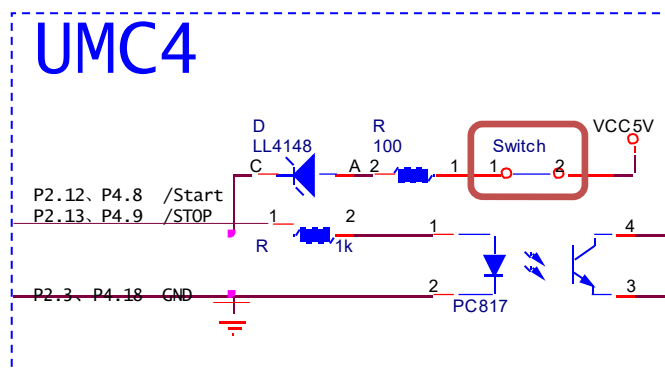
3.8.1 Scanner alignment:修改P1 (XY2-100) 输出

- (1) XY Swap: X、Y 输出线路互换
- (2) X Mirror、Y Mirror、Z Mirror: X、Y、Z 反相
- (3) XY Change: X、Y 坐标互换, 不会影响校正档

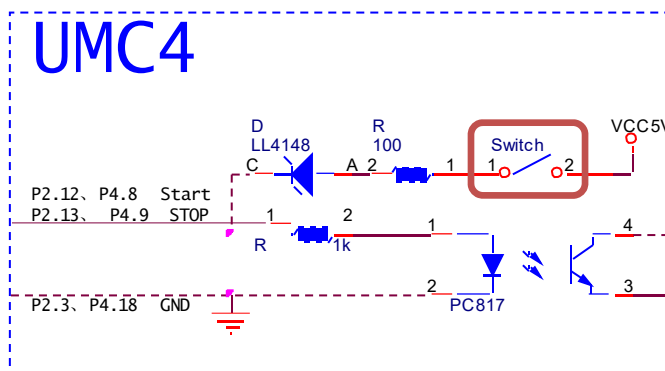
3.8.2 DAC Setting:修改P2 (Analog out) 输出电压

3.8.3 Input Sensor Type:设定P2、P4（Start、Stop）

Common Anode: 如下图Switch 短路, /Start、/Stop 为LOW 驱动



Common Cathode: 如下图Switch 开路, Start、Stop 为High 驱动



3.8.4 Signal Polarity（Enable Active Low）

- (1) 设定P2、P4 输入 Start、Stop 驱动相位, 勾选为反相
- (2) 设定P2输出TTL 讯号电位, 勾选为低电位触发
- (3) 设定P4 输出光耦合相位, 勾选为反相
- (4) 选择FPK/R05 输出(旧版试用 IP1. 2. 1), 新版改成 JP1 设定
- (5) 设定P4 IN3、IN4 类型, 勾选为Limit+ -
- (6) 设定P4 轴控, 可选择为X、Y、Z、R 轴, 预设R 轴

3.8.5 Card ID Define:UMC4编号设定

3.8.6 Information:显示UMC4本身相关信息

第四章 其他

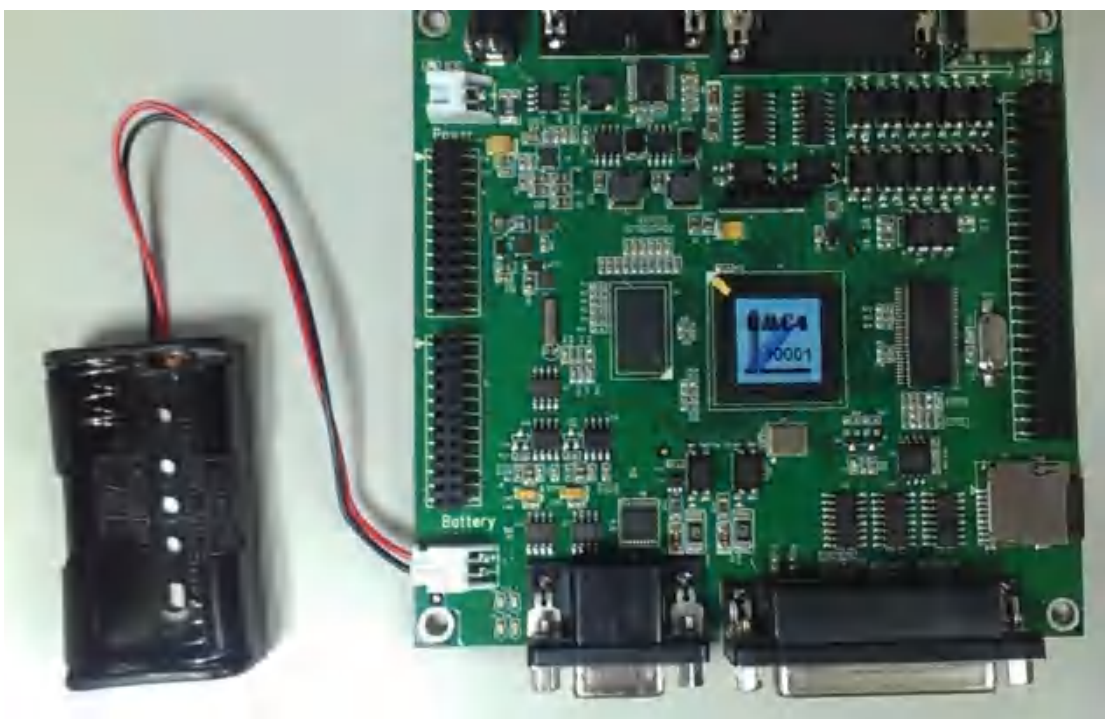
4.1 时钟

UMC4 内建时钟计数功能，可以存取日期、时间，并且可以把现在日期、时间雕刻出来。

4.1.1 硬件配置

- (1) J7 必需接上+1.5V ~+4.5V 的电池，否则当 UMC4 断电，日期、时间就会被归零
- (2) 4-1-1-2 在 UMC4 断电的情况下，一般 1000mAH 的电池，时间大约可以存取 3 年

注：当 UMC4 通电时，会改用 UMC4 电量，可让电池维持时间加长。但 UMC4 通电时，电池还是有极微量的消耗



4.1.2 软件设定（时间更新方式）

- (1) 当进入 MM-SA 时，会自动写入计算机目前的时间日期
- (2) 可以在 PLC 人机接口中设定

4.2 脱机雕刻的选择档案方式

4.2.1 PLC人机接口中选择

在 PLC 人机接口中，可以选择您要雕刻的档案，并可以设定基本参数

4.2.2 利用外部I/O选择（P4接口）

IN4	IN3	IN2	IN1	档案编号	IN4	IN3	IN2	IN1	档案编号
0	0	0	0	#01	1	0	0	0	#09
0	0	0	1	#02	1	0	0	1	#10
0	0	1	0	#03	1	0	1	0	#11
0	0	1	1	#04	1	0	1	1	#12
0	1	0	0	#05	1	1	0	0	#13
0	1	0	1	#06	1	1	0	1	#14
0	1	1	0	#07	1	1	1	0	#15
0	1	1	1	#08	1	1	1	1	#16

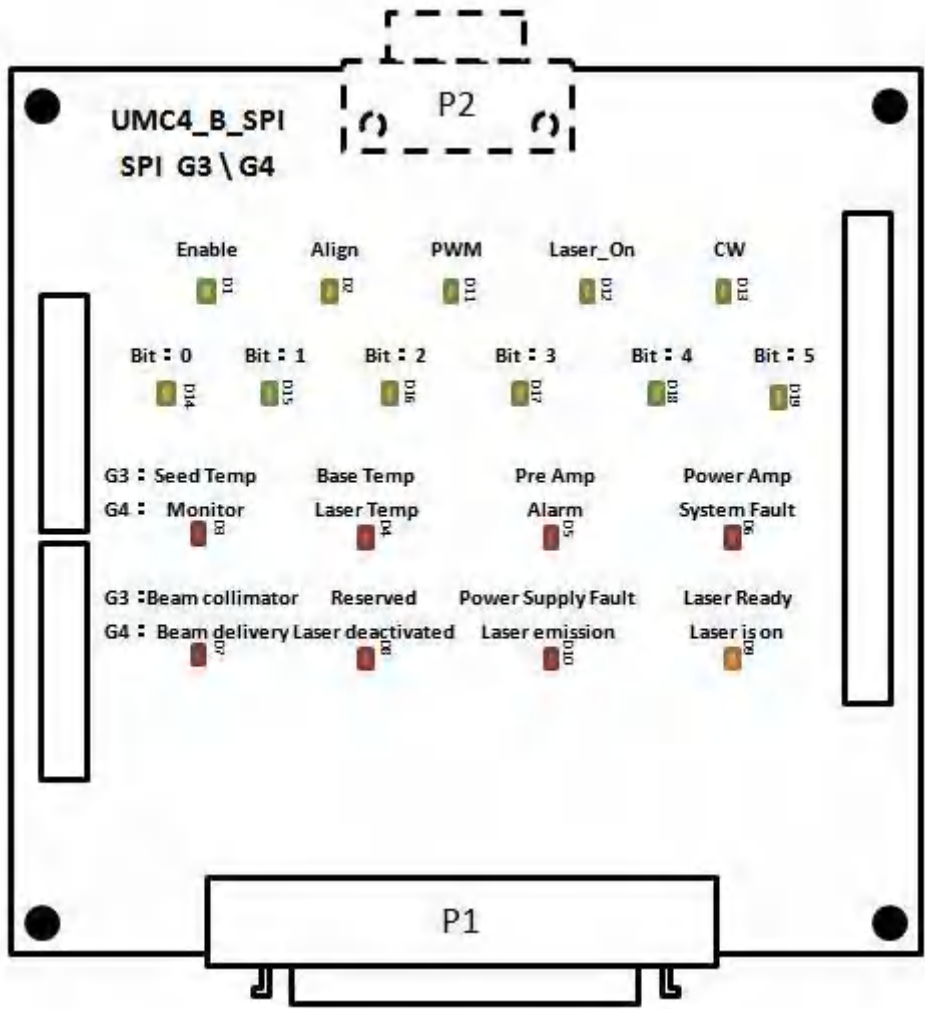
4.3 LED状态显示（D1~D8）

LED 编号	颜 色	功 能
D1	红	UMC4 核心状态灯，正常运作时发亮。
D2	红	USB 数据传输中会闪烁
D3	红	UMC4 正在初始化设定中，请稍待再使用UMC4。
D4	黄	保留
D5	红	保留
D6	绿	灯亮时，代表UMC4 可以正常运行。
D7	红	Power 灯号，有电源输入时发亮。
D8	绿	USB 灯号，USB 连接至计算机时发亮。

第五章 UMC4_B_SPI子卡

UMC4_B_SPI子卡（相容G3/G4）

5.1 外观尺寸



名称	用途说明
P1	SPI 激光接口，用SCSI 68Pin1 对1 线和激光相连即可。
P2	RS232 输入，利用D-SUB 9Pin 1 对1 线和计算机RS232 相连，即可用S/W 控制SPI 激光(预设不使用)。

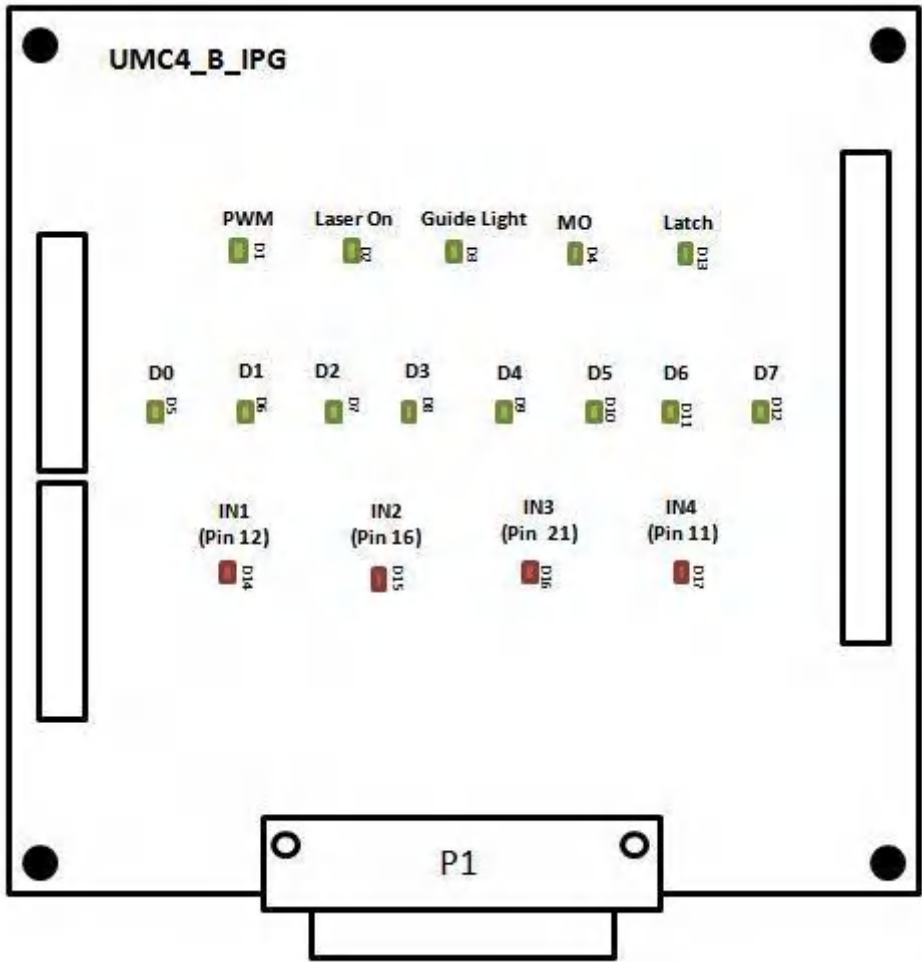
5.2 LED状态说明

名称	SPI 脚位	说 明	
LED	SCSI68Pin	SPI G3	SPI G4
D1	7	Global Enable	Laser_enable_h D2
D2	6	Alignment laser enable	Pilot_laser_enable_h
D3	3	Seed laser temperature fault	Monitor
D4	8	Base plate temperature fault	Laser temperature
D5	9	Pre-amplifier current fault	Alarm
D6	10	Power-amplifier current fault	System fault D7
D7	11	Beam collimator fault	Beam delivery
D8	12	Reserved fault indicator	Laser deactivated
D9	14	Laser Ready (no fault)	Laser is on
D10	16	Power Supply Fault	Laser emission warning
D11	13	External Pulse Trigger	Pulse_trigger_h
D12	5	Laser Emission Gate	Laser_emission_gate_h
D13	21	Pulsed/CW Mode select	Laser_Pulse_CW_h
D14	17	State Select: bit 0	DI_0
D15	18	State Select: bit 1	DI_1
D16	19	State Select: bit 2	DI_2
D17	20	State Select: bit 3	DI_3
D18	51	State Select: bit 4	DI_4
D19	52	State Select: bit 5	DI_5

第六章 UMC4_B_IPG子卡

UMC4_B_IPG子卡（相容Type D/D1）

6.1 外观尺寸



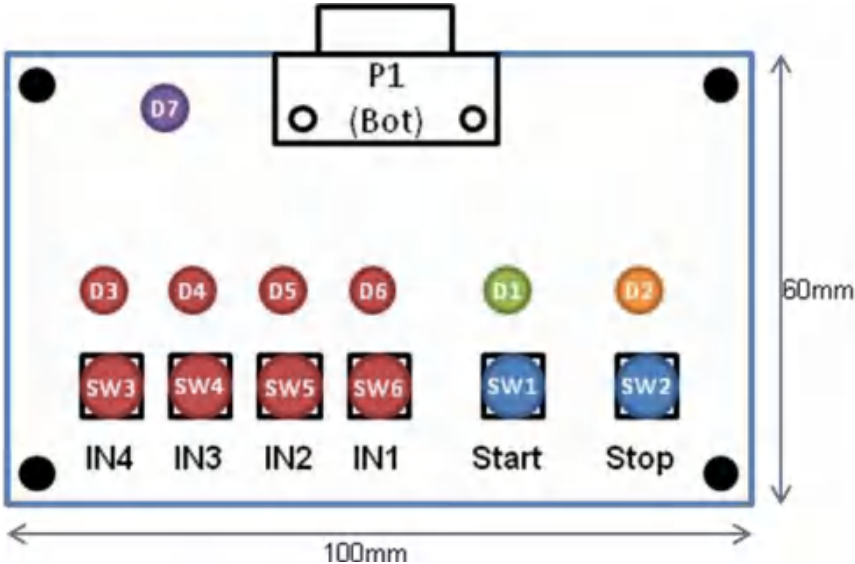
名称	用途说明
P1	IPG 激光接口，用D-SUB 25Pin 1 对1 线和激光相连即可

6.2 LED状态说明

LED 名称	IPG 脚位 D-SUB 25-pin	说 明
D1	20	Sync
D2	19	Modulation
D3	22	Guide
D4	18	EE
D5	1	Power Setting D0
D6	2	Power Setting D1
D7	3	Power Setting D2
D8	4	Power Setting D3
D9	5	Power Setting D4
D10	6	Power Setting D5
D11	7	Power Setting D6
D12	8	Power Setting D7
D13	9	Latch
D14	12	Laser alarms status
D15	16	Laser alarms status
D16	21	Laser alarms status
D17	11	Laser alarms status

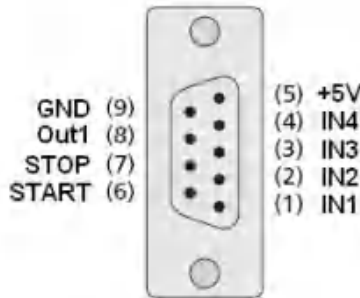
第七章 UMC4_B_FSelector子卡

7.1 外观尺寸



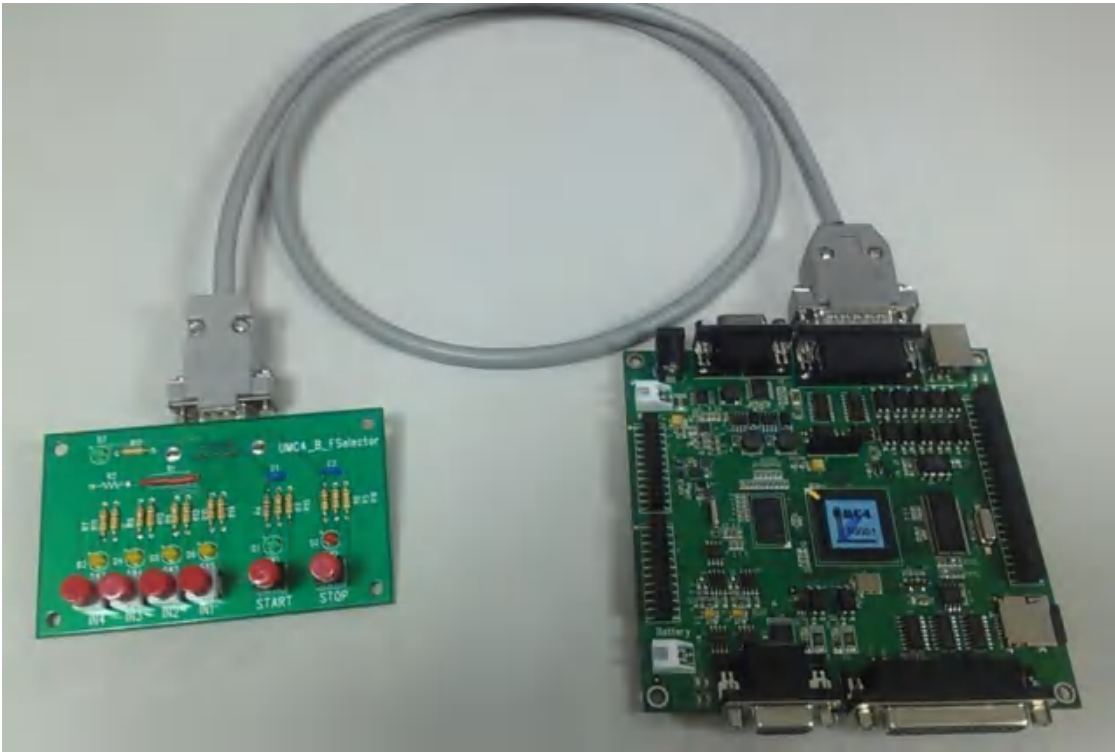
名 称	用途说明
P1	I/O 连接口
SW1	START
SW2	STOP
SW3~SW6	IN4~IN1(档案选择输入)

7.1.1 P1 (I/O 连接口)：连接UMC4

9-pin 脚位图	脚位	脚位说明
	1 ~ 4	IN1 ~ IN4
	5	+5V
	6	START
	7	STOP
	8	Marking Randy
	9	GND

7.2 接线

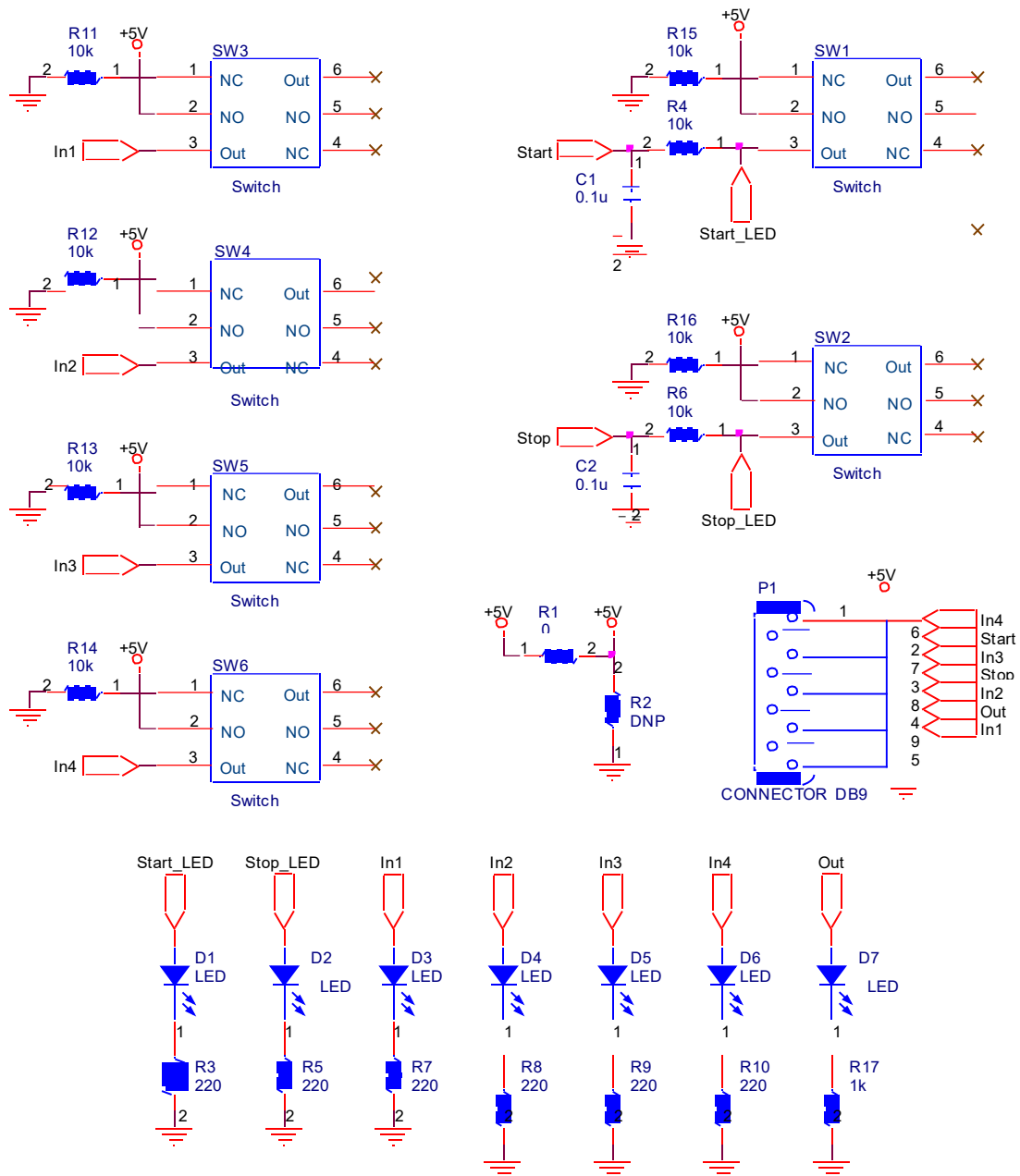
7.2.1 接线图



7.2.2 UMC4_B_Fselector To UMC4接线表

UMC4_B_FSelector P1 D-SUB9Pin	脚位说明	UMC4 P4 D-SUB26Pin
1 ~ 4	IN1 ~ IN4	16、17、25、26
5	+5V	6 or 10
6	START	8
7	STOP	9
8	Marking Ready	21
9	GND	18
	OPTO V+	19 (必需和+5V相连)
	OPTO GND	24 (必需和GND 相连)

7.3 UMC4_B_FSelector电路图

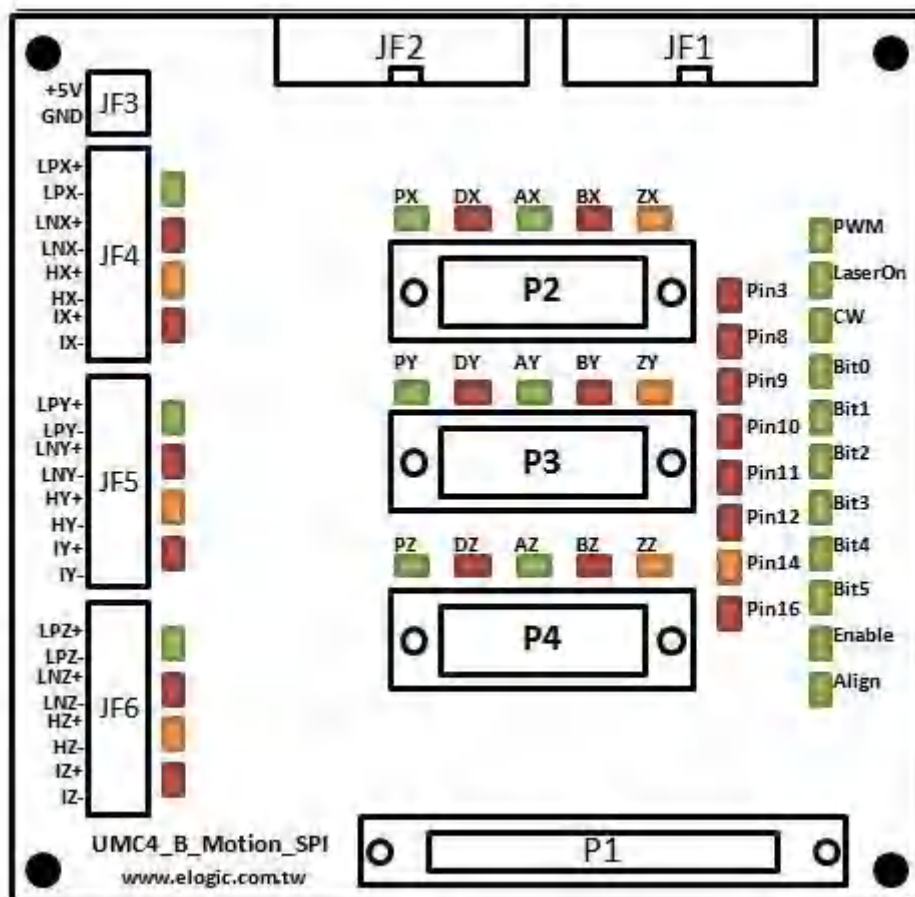


注: 当按钮(SW 1~6)按下时 Out (Pin 3) 和 NO (Pin 2) 短路, 放开时 Out (Pin 3) 和 NC (Pin 1) 短路

第八章 UMC4_B_Motion子卡

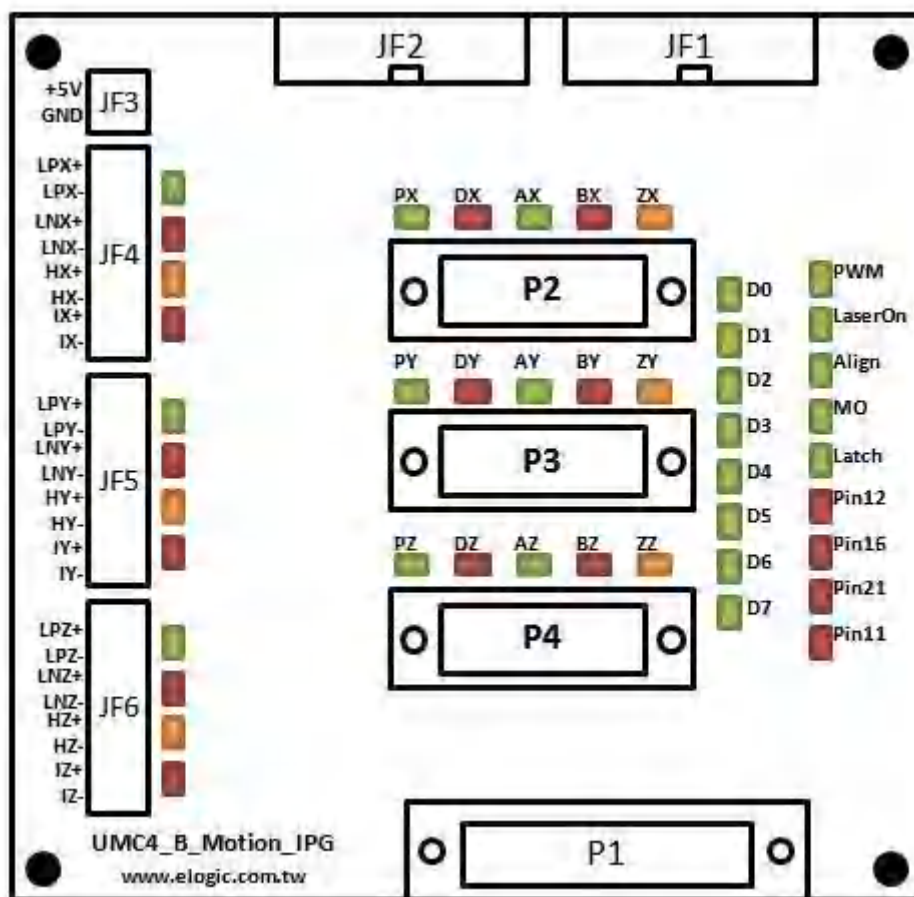
8.1 外观尺寸

8.1.1 UMC4_B_Motion_SPI子卡：（相容SPI G3/G4）



名称	用途说明
P1	SCSI 68Pin: SPI 激光接口，用1对1 线与激光相连即可
P2、P3、P4	D-SUB 15F: X、Y、Z Motion、Encoder 接口
JF3	端子台2Pin: +5V 电源及0V 输出
JF4、JF5、JF6	端子台8Pin: Sensor 输入接口

8.1.2 UMC4_B_Motion_IPG子卡：（相容IPG Type D/D1）



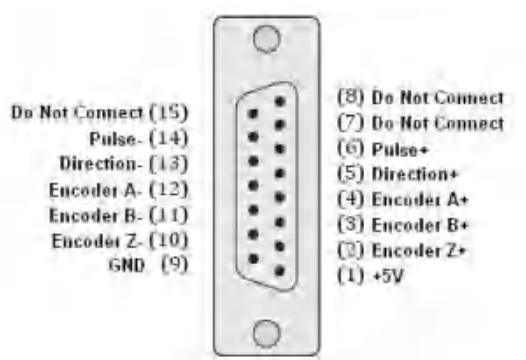
名 称	用途说明
P1	D-SUB 25F: IPG 激光接口, 用1对1线与激光连接即可
P2、P3、P4	D-SUB 15F: X、Y、Z Motion、Encoder接口
JF3	端子台2Pin: +5V 电源及0V 输出
JF4、JF5、JF6	端子台8Pin: Sensor输入接口

8.2 脚位配置

8.2.1 P1接口定义

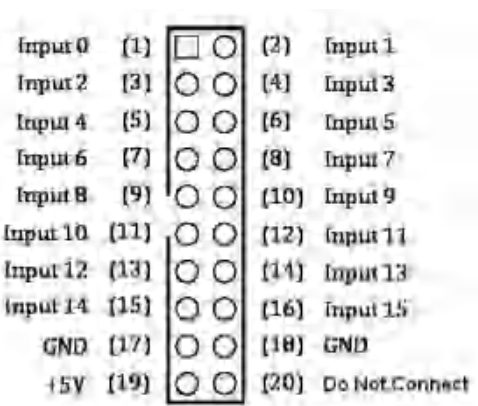
请参考 SPI G3 / G4 手册或 IPG Type D / D1 手册。请直接使用 1 对 1 线与激光相连。

8.2.2 P2~P4接口定义

9-pin 脚位图	脚位	脚位说明
	1	+5V
	2、10	Encoder Z+、Encoder Z-
	3、11	Encoder B+、Encoder B-
	4、12	Encoder A+、Encoder A-
	5、13	Direction+、Direction-
	6、14	Pulse+、Pulse-
	7、8、15	未定义
	9	GND

8.2.3 JF1(Input)接口定义：（TTL输入）

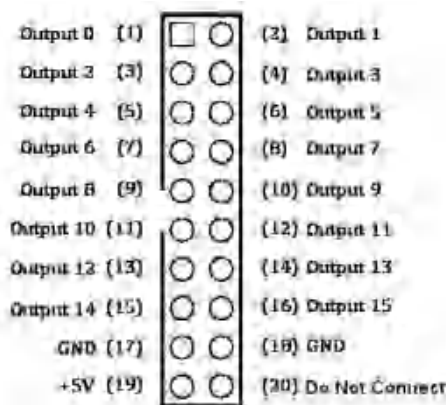
TTL 的输入点在没有接线的情况之下，软件所读到的值是 0；在有接线的情况下，0V 输入软件得到 0 值、5V 输入软件得到 1 值。且要考虑噪声干扰的问题。JF1 的脚位配置，兼容于一般工业用之隔离子板，（如：研华科技的 PCLD-782，或是力激科技的 DB-16P），使用这类子板，会隔离外部的输入电源，有保护的功能，配线也比较容易。

脚位	名称	说明	20-pin 脚位图
1	General Digital Input 0		
2	General Digital Input 1		
3	General Digital Input 2		
4	General Digital Input 3		
5	General Digital Input 4		
6	General Digital Input 5		
7	General Digital Input 6		
8	General Digital Input 7		
9	General Digital Input 8		
10	General Digital Input 9		
11	General Digital Input 10		
12	General Digital Input 11		
13	General Digital Input 12		
14	General Digital Input 13		
15	General Digital Input 14	Start	
16	General Digital Input 15	E. Stop	
17	GND		

18	GND		
19	+5V		
20	Do Not Connect(未定义)		

8.2.4 JF2(Output)接口定义：（TTL输出）

TTL 的输出，当软件设定为 0 时，输出电压为 0V，当软件设定为 1 时，输出电压为 5V。 JF2 的脚位配置，兼容于一般工业用之继电器子板，（如：研华科技的 PCLD-885，或是力激科技的 DB-16R），使用这类子板，可以利用光耦合器或继电器，隔离外部的电源，并以较大的电流推动周边组件，有保护的功能，配线也比较容易。

脚 位	名 称	说 明	20-pin 脚位图
1	General Digital Output 0		 Output 0 (1) (2) Output 1 Output 3 (3) (4) Output 3 Output 4 (5) (6) Output 5 Output 6 (7) (8) Output 7 Output 8 (9) (10) Output 9 Output 10 (11) (12) Output 11 Output 12 (13) (14) Output 13 Output 14 (15) (16) Output 15 GND (17) (18) GND +5V (19) (20) Do Not Connect
2	General Digital Output 1		
3	General Digital Output 2		
4	General Digital Output 3		
5	General Digital Output 4		
6	General Digital Output 5		
7	General Digital Output 6		
8	General Digital Output 7		
9	General Digital Output 8		
10	General Digital Output 9		
11	General Digital Output 10		
12	General Digital Output 11		
13	General Digital Output 12		
14	General Digital Output 13	Marking Ready	
15	General Digital Output 14	Program Ready	
16	General Digital Output 15	Marking End	
17	GND		
18	GND		
19	+5V		
20	Do Not Connect (未定义)		

8.2.5 JF4~JF6（Sensor）接口定义：（端子台）

名 称	说 明
LPX+、LPY+、LPZ+	Positive Limit + (X、Y、Z)正极限+
LPX-、LPY-、LPZ-	Positive Limit - (X、Y、Z)正极限-
LNx+、LNY+、LNZ+	Negative Limit + (X、Y、Z)负极限+
LNx-、LNY-、LNZ-	Negative Limit - (X、Y、Z)负极限-
HX+、HY+、HZ+	Home + (X、Y、Z)原点+
HX-、HY-、HZ-	Home -(X、Y、Z)原点-
IX+、IY+、IZ+	InPosition + (X、Y、Z)定位点+
IX-、IY-、IZ-	InPosition - (X、Y、Z)定位点-

8.2.6 D1~D19激光LED状态

(1) UMC4_B_Motion_SPI

名 称	SPI 脚位	说 明	
LED	SCSI68Pin	SPI G3	SPI G4
D1	13	External Pulse Trigger	Pulse_trigger_h
D2	5	Laser Emission Gate	Laser_emission_gate_h
D3	21	Pulsed/CW Mode select	Laser_Pulse_CW_h
D4	17	State Select: bit 0	DI_0
D5	18	State Select: bit 1	DI_1
D6	19	State Select: bit 2	DI_2
D7	20	State Select: bit 3	DI_3
D8	51	State Select: bit 4	DI_4
D9	52	State Select: bit 5	DI_5
D10	7	Global Enable	Laser_enable_h
D11	6	Alignment laser enable	Pilot_laser_enable_h
D12	3	Seed laser temperature fault	Monitor
D13	8	Base plate temperature fault	Laser temperature
D14	9	Pre-amplifier current fault	Alarm D15
D15	10	Power-amplifier current fault	System fault
D16	11	Beam collimator fault	Beam delivery
D17	12	Reserved fault indicator	Laser deactivated
D18	14	Laser Ready (no fault)	Laser is on
D19	16	Power Supply Fault	Laser emission warning

(2) UMC4_B_Motion_IPG

LED 名称	IPG 脚位 D-SUB 25-pin	说 明
D1	20	Sync
D2	19	Modulation
D3	22	Guide
D4	18	EE
D5	1	Power Setting D0
D6	2	Power Setting D1
D7	3	Power Setting D2
D8	4	Power Setting D3
D9	5	Power Setting D4
D10	6	Power Setting D5
D11	7	Power Setting D6
D12	8	Power Setting D7
D13	9	Latch
D14	12	Laser alarms status
D15	16	Laser alarms status
D16	21	Laser alarms status
D17	11	Laser alarms status

8.2.7 D20~D46 Motion LED状态

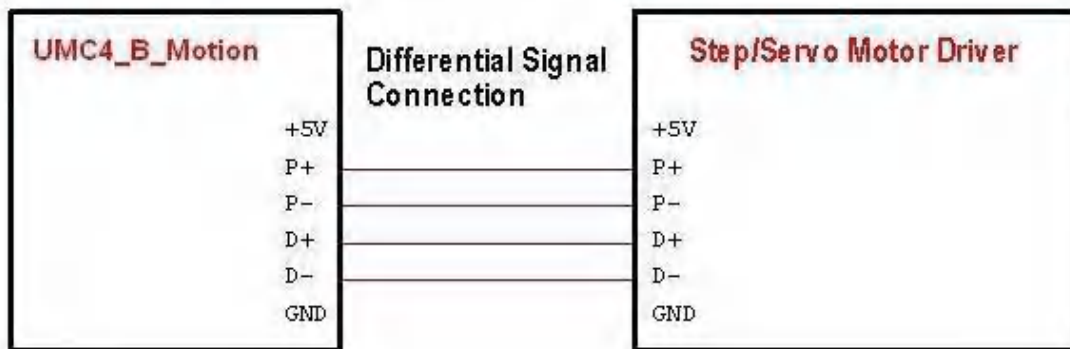
LED 编号	名 称	LED 编号	名 称
D20	Pulse X	D24	Positive Limit Z
D21	Direction X	D25	Negative Limit Z
D22	Pulse Y	D26	Home Z
D23	Direction Y	D27	InPosition Z
D24	Pulse Z	D28	Encoder AX
D25	Direction Z	D29	Encoder BX
D26	Positive Limit X	D30	Encoder ZX
D27	Negative Limit X	D31	Encoder AY
D28	Home X	D32	Encoder BY
D29	InPosition X	D33	Encoder ZY
D20	Positive Limit Y	D34	Encoder AZ
D21	Negative Limit Y	D35	Encoder BZ
D22	Home Y	D36	Encoder ZZ
D23	InPosition Y		

8.3 配接线

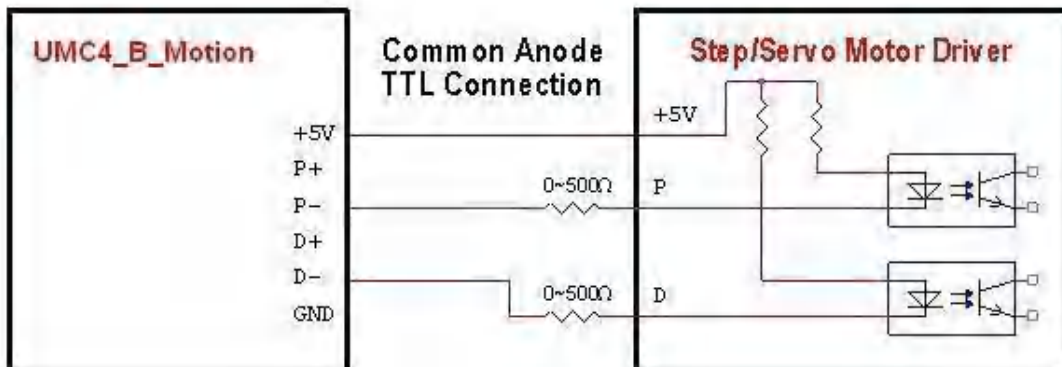
8.3.1 步进/伺服马达讯号配接

在 P2~P4 接口上，有马达驱动器的 Pulse 与 Direction 讯号接脚，其与马达驱动器的接线方式有下列三种，请依马达驱动器的规格配接。

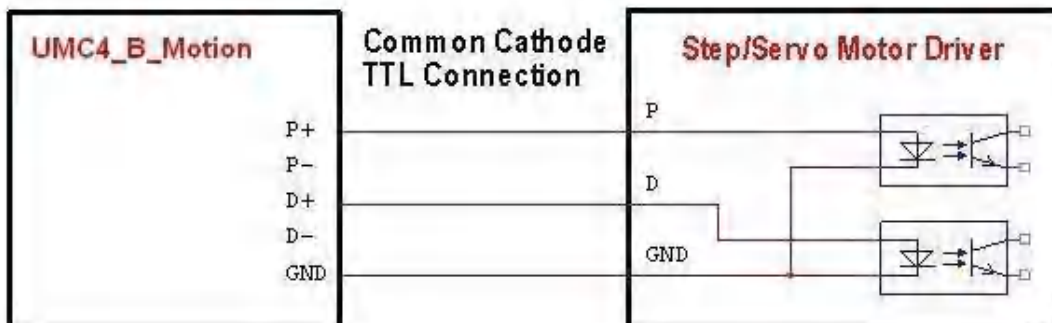
(1) 马达驱动器为差动讯号 (Different Signal)



(2) 马达驱动器为 TTL 共阳 (Common Anode)



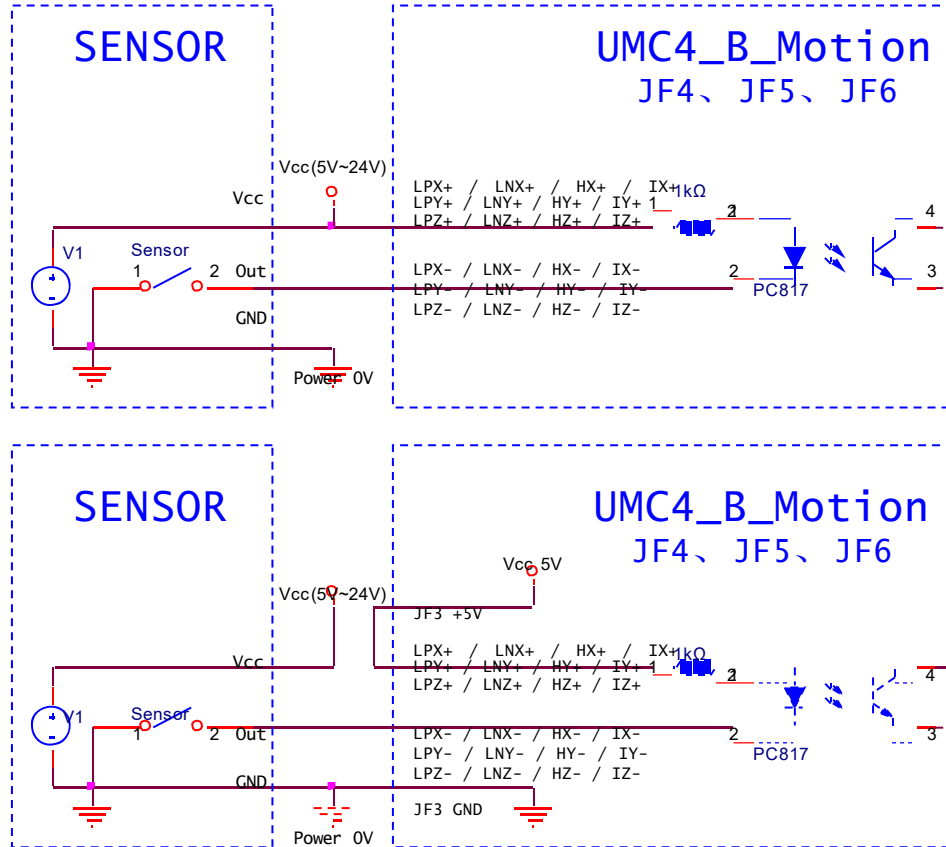
(3) 马达驱动器为 TTL 共阴 (Common Cathode)



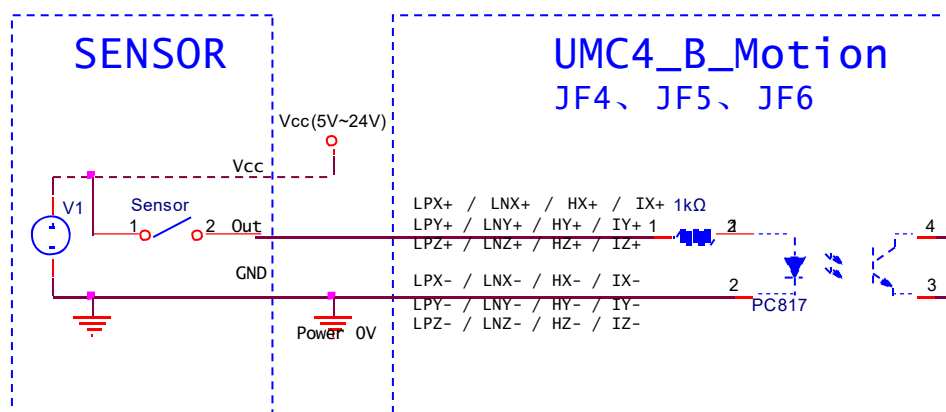
8.3.2 轴控讯号配接

极限(Limit)、InPosition、及 Home 等轴控讯号的配接方式。

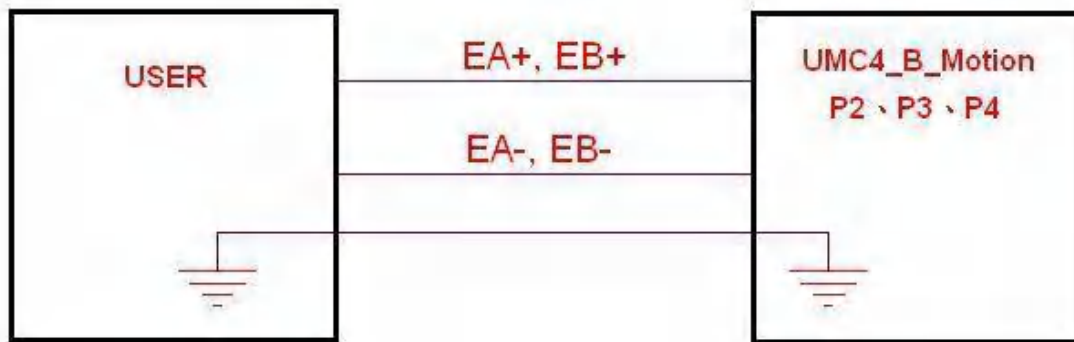
(1) 共阴(Common Cathode)Sensor 接法 (NPN 型)



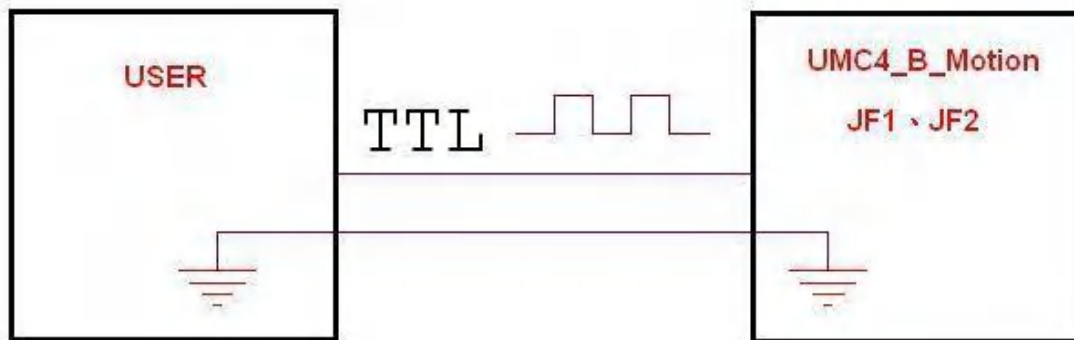
(2) 共阳(Common Anode)Sensor 接法 (PNP 型)



8.3.3 编码器讯号配接

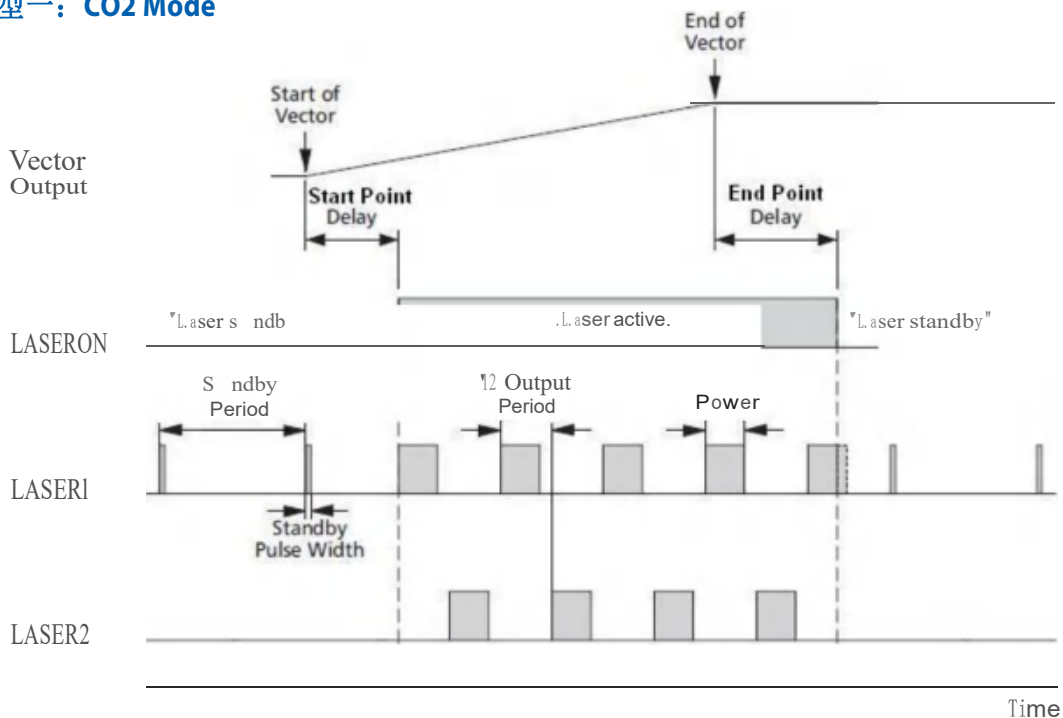


8.3.4 TTL讯号配接 (JF1、JF2)

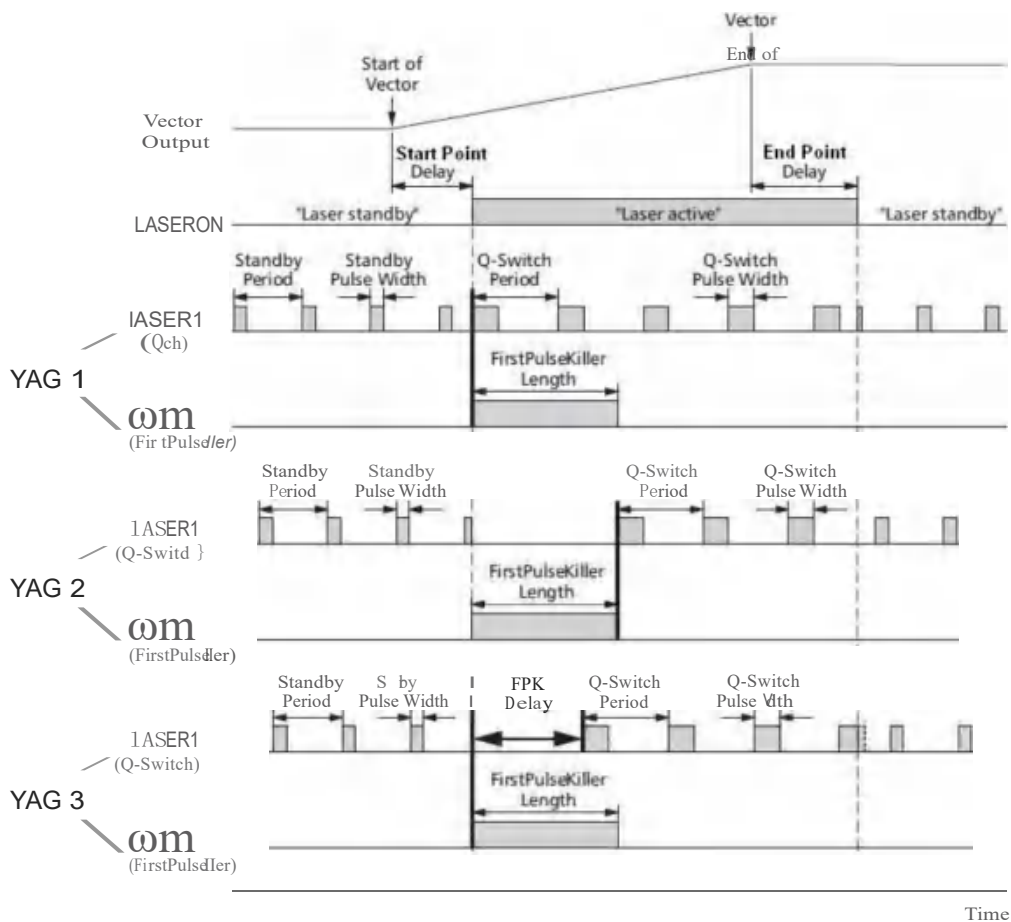


附录一 各种激光模式时序

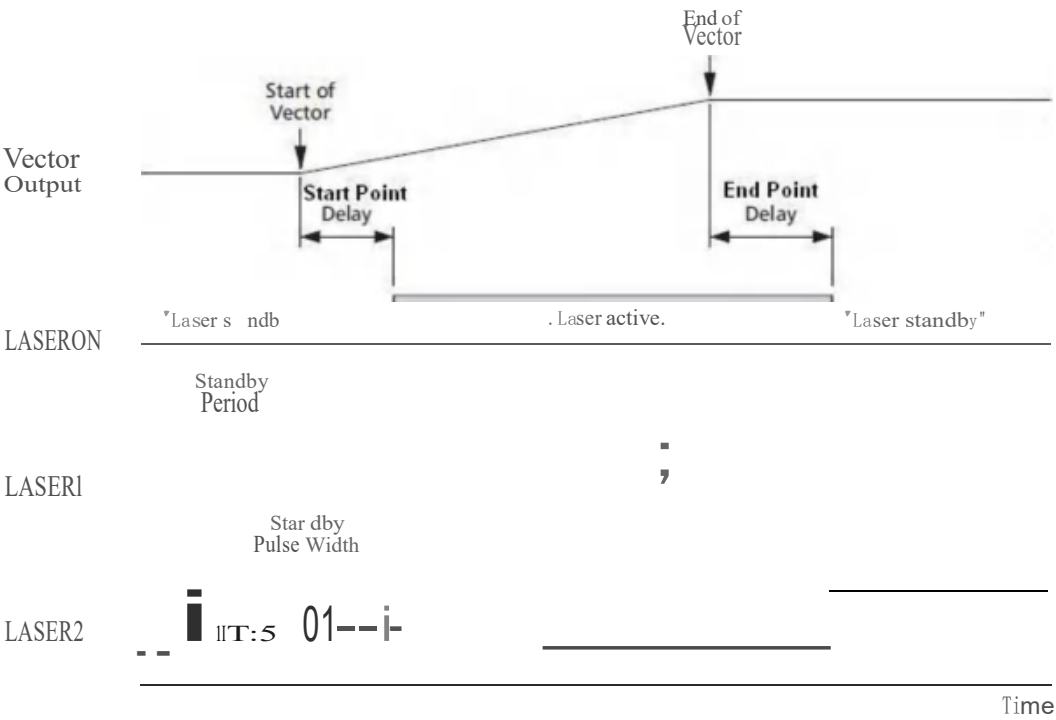
类型一：CO2 Mode



类型二：YAG 1-3 Mode



类型三：R05 Mode



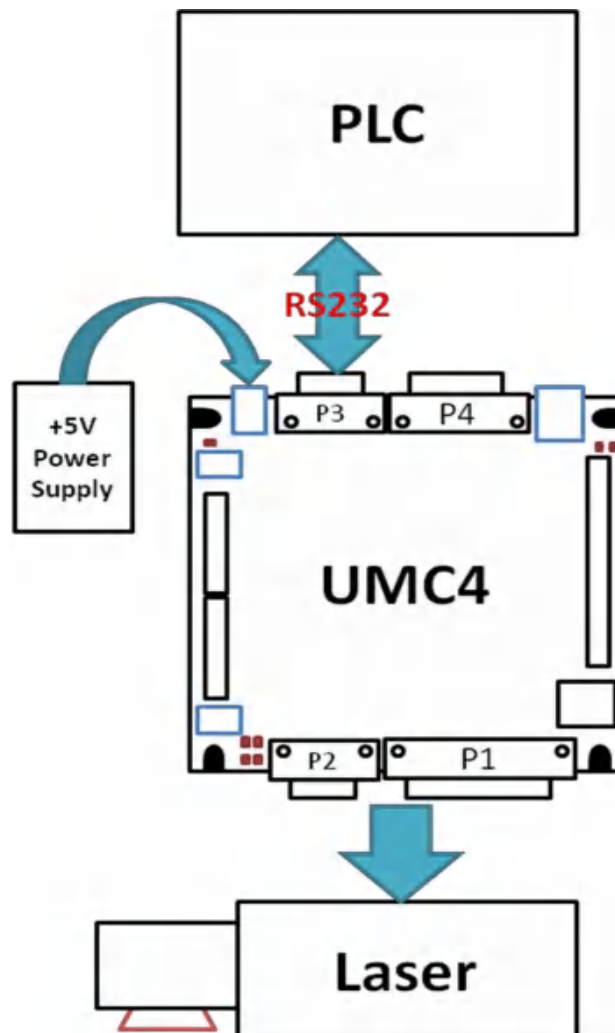
附录二 UMC4与PLC连接

UMC4 提供一组 RS232 接口(P3)作为 PLC 控制之用，PLC 所采用的通讯协议为三菱 (Mitsubishi) FX 系列

RS232 通讯参数如下：

Baud	115200 BPS
Parity Check	Even
Data Bit	8
Stop Bit	1
Flow Control	none

UMC4、PLC 及 Laser 连接方式如下图：



附录三 PLC地址定义表（三菱F×2）

System Reg		D0 – D255 (0x1000 – 0x11ff)	
Addr	Name	Name	Type
0x5800	PWM Mode	D0	Unsigned Short
0x5802	Laser Mode	D1	Unsigned Short
0x5804	Test Execute	D2	Unsigned Short
0x5806	FLASH Update	D3	Unsigned Short
0x5808	Standby Half Period	D4	Unsigned Long
0x580c	Standby Width	D6	Unsigned Long
0x5810	CorTable	D8	Unsigned Short
0x5812	FLY_MODE_X	D9	Unsigned Short
0x5814	FLY_MODE_Y	D10	Unsigned Short
0x5816	FLY_MODE_Z	D11	Unsigned Short
0x5818	FLY_VALUE_X	D12	Long
0x581c	FLY_VALUE_Y	D14	Long
0x5820	FLY_VALUE_Z	D16	Long
0x5824	FLY_DELAY_X	D18	Unsigned Long
0x5828	FLY_DELAY_Y	D20	Unsigned Long
0x582c	FLY_DELAY_Z	D22	Unsigned Long
0x5830	Laser Test : HPeriod	D24	Unsigned Long
0x5834	Laser Test : PWidth	D26	Unsigned Long
0x5838	Laser Test: Power	D28	Unsigned Short
0x583a	Preview File	D29	Unsigned Short
0x583c	Preview Speed	D30	Unsigned Long
0x5840	Preview Offset X	D32	Short
0x5842	Preview Offset Y	D33	Short
0x5844	Preview Matrix 0	D34	Long
0x5848	Preview Matrix 1	D36	Long
0x584c	Preview Matrix 2	D38	Long
0x5850	Preview Matrix 3	D40	Long
0x5854	PreLoadFile	D42	Unsigned Long
0x5858	Device Name	D44	Char (16)

Laser Reg		D256 – D511 (0x1200 – 0x13ff)	
Addr	Name	Name	Type
0x5870	SPI_ENABLE_OUT	D256	Unsigned Short
0x5872	SPI_CW_OUT	D257	Unsigned Short
0x5874	SPI_ALIGN_OUT	D258	Unsigned Short
0x5876	SPI_WAVEFORM_OU	D259	Unsigned Short
0x5878	SPI_WAVEFORM_OU	D260	Unsigned Short
0x587a	SPI_WAVEFORM_OU	D261	Unsigned Short
0x587c	SPI_WAVEFORM_OU	D262	Unsigned Short
0x587e	SPI_WAVEFORM_OU	D263	Unsigned Short
0x5880	SPI_WAVEFORM_OU	D264	Unsigned Short
0x5882	IPG_POWER_OUT0	D265	Unsigned Short
0x5884	IPG_POWER_OUT1	D266	Unsigned Short
0x5886	IPG_POWER_OUT2	D267	Unsigned Short
0x5888	IPG_POWER_OUT3	D268	Unsigned Short
0x588a	IPG_POWER_OUT4	D269	Unsigned Short
0x588c	IPG_POWER_OUT5	D270	Unsigned Short
0x588e	IPG_POWER_OUT6	D271	Unsigned Short
0x5890	IPG_POWER_OUT7	D272	Unsigned Short
0x5892	IPG_LATCH_OUT	D273	Unsigned Short
0x5894	IPG_MO_OUT	D274	Unsigned Short
0x5896	IPG_GUIDE_OUT	D275	Unsigned Short
0x5898	IPG_LATCH_TIME	D276	Unsigned Long
0x589c	IPG_MO_DELAY	D278	Unsigned Long
0x58a0	SoftStartMode	D280	Unsigned Short
0x58a2	SoftStartNum	D281	Unsigned Short
0x58a4	SoftStartLevel0	D282	Unsigned Short
0x58a6	SoftStartLevel1	D283	Unsigned Short
0x58a8	SoftStartLevel2	D284	Unsigned Short
0x58aa	SoftStartLevel3	D285	Unsigned Short
0x58ac	SoftStartLevel4	D286	Unsigned Short
0x58ae	SoftStartLevel5	D287	Unsigned Short
0x58b0	SoftStartLevel6	D288	Unsigned Short
0x58b2	SoftStartLevel7	D289	Unsigned Short
0x58b4	SoftStartLevel8	D290	Unsigned Short
0x58b6	SoftStartLevel9	D291	Unsigned Short

0x58b8	SoftStartLevel10	D292	Unsigned Short
0x58ba	SoftStartLevel11	D293	Unsigned Short
0x58bc	SoftStartLevel12	D294	Unsigned Short
0x58be	SoftStartLevel13	D295	Unsigned Short
0x58c0	SoftStartLevel14	D296	Unsigned Short
0x58c2	SoftStartLevel15	D297	Unsigned Short
0x58c4	R05Init	D298	Unsigned Long
0x58c8	R05Interval	D300	Unsigned Long
0x58cc	R05Level0	D302	Unsigned Short
0x58ce	R05Level1	D303	Unsigned Short
0x58d0	R05Level2	D304	Unsigned Short
0x58d2	R05Level3	D305	Unsigned Short
0x58d4	R05Level4	D306	Unsigned Short
0x58d6	R05Level5	D307	Unsigned Short
0x58d8	R05Level6	D308	Unsigned Short
0x58da	R05Level7	D309	Unsigned Short
0x58dc	R05Level8	D310	Unsigned Short
0x58de	R05Level9	D311	Unsigned Short
0x58e0	R05Level10	D312	Unsigned Short
0x58e2	R05Level11	D313	Unsigned Short
0x58e4	R05Level12	D314	Unsigned Short
0x58e6	R05Level13	D315	Unsigned Short
0x58e8	R05Level14	D316	Unsigned Short
0x58ea	R05Level15	D317	Unsigned Short
0x58ec	IPG Setting	D318	Unsigned Short
0x58ee	CO2 Setting	D319	Unsigned Short
0x58f0	YAG Setting	D320	Unsigned Short
0x58f2	SPI Setting	D321	Unsigned Short
0x58f4	SPI Align Off Delay	D322	Unsigned Long
0x58f8	SPI Enable Delay	D324	Unsigned Long

Layer Reg		D8000 – D8255 (0x0e00 – 0x0fff)	
Addr	Name	Name	Type
0x0X00	Power	D8000	Unsigned Short
0x0X02	Simmer Current	D8001	Unsigned Short
0x0X04	HalfPeriod	D8002	Unsigned Long
0x0X08	Duty width	D8004	Unsigned Long
0x0X0c	FPK	D8006	Unsigned Long
0x0X10	FPKLeadTime	D8008	Unsigned Long
0x0X14	Jump Speed	D8010	Unsigned Long
0x0X18	Mark Speed	D8012	Unsigned Long
0x0X1c	LaserON Delay	D8014	Long
0x0X20	LaserOFF Delay	D8016	Unsigned Long
0x0X24	Jump Delay	D8018	Unsigned Long
0x0X28	Poly Delay	D8020	Unsigned Long
0x0X2c	Mark Delay	D8022	Unsigned Long
0x0X30	OffsetX	D8024	Short
0x0X32	OffsetY	D8025	Short
0x0X34	Matrix 0	D8026	Long
0x0X38	Matrix 1	D8028	Long
0x0X3c	Matrix 2	D8030	Long
0x0X40	Matrix 3	D8032	Long
0x0X44	Waveform	D8034	Unsigned Short
0x0X46	CW Mode	D8035	Unsigned Short
0x0x48	Wobble Frequency	D8036	Unsigned Long
0x0x4c	Wobble Amp	D8038	Unsigned Long
0x0x50	Spot Time	D8040	Unsigned Long

AutoTxt Reg		T0 – T255 (0x0800 – 0x09ff)	
Addr	Name	Addr	Name
0x1X00	Map Table	T0	Unsigned Short
0x1X02	Digital	T1	Unsigned Short
0x1X04	Carry	T2	Unsigned Short
0x1X06	Increase	T3	Short
0x1X08	Repeat	T4	Unsigned Long
0x1X0c	Interval_x	T6	Unsigned Short
0x1X0e	Interval_y	T7	Unsigned Short
0x1X10	TxtDirType	T8	Unsigned Short
0x1X12	BasedZero	T9	Unsigned Short
0x1X14	Padding	T10	Unsigned Short
0x1X16	TimeType	T11	Unsigned Short
0x1X18	Separate	T12	Unsigned Short
0x1X1a	Year character	T13	Unsigned Short
0x1X1c	Month character	T14	Unsigned Short
0x1X1e	Week Day character	T15	Unsigned Short
0x1X20	InitValue_Digital0	T16	Unsigned Short
0x1X22	InitValue_Digital1	T17	Unsigned Short
0x1X24	InitValue_Digital2	T18	Unsigned Short
0x1X26	InitValue_Digital3	T19	Unsigned Short
0x1X28	InitValue_Digital4	T20	Unsigned Short
0x1X2a	InitValue_Digital5	T21	Unsigned Short
0x1X2c	InitValue_Digital6	T22	Unsigned Short
0x1X2e	InitValue_Digital7	T23	Unsigned Short
0x1X30	InitValue_Digital8	T24	Unsigned Short
0x1X32	InitValue_Digital9	T25	Unsigned Short
0x1X34	InitValue_Digital10	T26	Unsigned Short
0x1X36	InitValue_Digital11	T27	Unsigned Short
0x1X38	InitValue_Digital12	T28	Unsigned Short
0x1X3a	InitValue_Digital13	T29	Unsigned Short
0x1X3c	InitValue_Digital14	T30	Unsigned Short
0x1X3e	InitValue_Digital15	T31	Unsigned Short
0x1X40	MaxValue_Digital0	T32	Unsigned Short
0x1X42	MaxValue_Digital1	T33	Unsigned Short
0x1X44	MaxValue_Digital2	T34	Unsigned Short

0x1X46	MaxValue_Digital3	T35	Unsigned Short
0x1X48	MaxValue_Digital4	T36	Unsigned Short
0x1X4a	MaxValue_Digital5	T37	Unsigned Short
0x1X4c	MaxValue_Digital6	T38	Unsigned Short
0x1X4e	MaxValue_Digital7	T39	Unsigned Short
0x1X50	MaxValue_Digital8	T40	Unsigned Short
0x1X52	MaxValue_Digital9	T41	Unsigned Short
0x1X54	MaxValue_Digital10	T42	Unsigned Short
0x1X56	MaxValue_Digital11	T43	Unsigned Short
0x1X58	MaxValue_Digital12	T44	Unsigned Short
0x1X5a	MaxValue_Digital13	T45	Unsigned Short
0x1X5c	MaxValue_Digital14	T46	Unsigned Short
0x1X5e	MaxValue_Digital15	T47	Unsigned Short
0x1X60	CurValue_Digital0	T48	Unsigned Short
0x1X62	CurValue_Digital1	T49	Unsigned Short
0x1X64	CurValue_Digital2	T50	Unsigned Short
0x1X66	CurValue_Digital3	T51	Unsigned Short
0x1X68	CurValue_Digital4	T52	Unsigned Short
0x1X6a	CurValue_Digital5	T53	Unsigned Short
0x1X6c	CurValue_Digital6	T54	Unsigned Short
0x1X6e	CurValue_Digital7	T55	Unsigned Short
0x1X70	CurValue_Digital8	T56	Unsigned Short
0x1X72	CurValue_Digital9	T57	Unsigned Short
0x1X74	CurValue_Digital10	T58	Unsigned Short
0x1X76	CurValue_Digital11	T59	Unsigned Short
0x1X78	CurValue_Digital12	T60	Unsigned Short
0x1X7a	CurValue_Digital13	T61	Unsigned Short
0x1X7c	CurValue_Digital14	T62	Unsigned Short
0x1X7e	CurValue_Digital15	T63	Unsigned Short
0x1X80	First Padding 0	T64	Unsigned Short
0x1X82	First Padding 1	T65	Unsigned Short
0x1X84	First Padding 2	T66	Unsigned Short
0x1X86	First Padding 3	T67	Unsigned Short
0x1X88	First Padding 4	T68	Unsigned Short
0x1X8a	First Padding 5	T69	Unsigned Short
0x1X8c	First Padding 6	T70	Unsigned Short
0x1X8e	First Padding 7	T71	Unsigned Short

0x1X90	Last Padding 0	T72	Unsigned Short
0x1X92	Last Padding 1	T73	Unsigned Short
0x1X94	Last Padding 2	T74	Unsigned Short
0x1X96	Last Padding 3	T75	Unsigned Short
0x1X98	Last Padding 4	T76	Unsigned Short
0x1X9a	Last Padding 5	T77	Unsigned Short
0x1X9c	Last Padding 6	T78	Unsigned Short
0x1X9e	Last Padding 7	T79	Unsigned Short
0x1Xa0	Size Scale X	T80	Unsigned Long
0x1Xa4	Size Scale Y	T82	Unsigned Long
0x1Xa8	SpacingMode	T84	Unsigned Short
0x1Xaa	TxtMode	T85	Unsigned Short
0x1Xac	First Padding Num	T86	Unsigned Short
0x1Xae	Last Padding Num	T87	Unsigned Short
0x1Xb0	RECT_SHOW	T88	Unsigned Short
0x1Xb2	RECT_Width	T89	Unsigned Short
0x1Xb4	RECT_Height	T90	Unsigned Short
0x1Xb6	RECT_UpSpace	T91	Unsigned Short
0x1Xb8	RECT_DownSpace	T92	Unsigned Short
0x1Xba	RECT_LeftSpace	T93	Unsigned Short
0x1Xbc	RECT_RightSpace	T94	Unsigned Short
0x1Xbe	ARC_SHOW	T95	Unsigned Short
0x1Xc0	ARC_DISTYPE	T96	Unsigned Long
0x1Xc4	ARC_LINESPACE	T98	Long
0x1Xc8	ARC_DISVALUE	T100	Long
0x1Xcc	ARC_BASEANGLE	T102	Long
0x1Xd0	ARC_BLTYPE	T104	Unsigned Short
0x1Xd2	ARC_NEGARRAY	T105	Unsigned Short
0x1Xd4	ARC_CENTERX	T106	Unsigned Short
0x1Xd6	ARC_CENTERY	T107	Unsigned Short
0x1Xd8	ARC_RADIUS	T108	Unsigned Long

File Reg (AA = 0x59 – 0x68)		C0 – C199 (0x0a00 – 0x0b8f)	
Addr	Name	Name	Type
0xAA00	File Addr	C0	Unsigned Long
0xAA04	File Name	C2	Char(16)
0xAA14	File Length	C10	Unsigned Long
0xAA18	CharTb Addr	C12	Unsigned Long
0xAA1c	CharTb Length	C14	Unsigned Long
0xAA20	MarkData Addr	C16	Unsigned Long
0xAA24	MarkData Length	C18	Unsigned Long
0xAA28	Layer Param Num	C20	Unsigned Short
0xAA2a	AutoTxt Param Num	C21	Unsigned Short
0xAA2c	CharTb Num	C22	Unsigned Short
0xAA2e	TempData	C23	Unsigned Short
0xAA30	MaxWorkCnt	C24	Unsigned Long
0xAA34	WorkCnt	C26	Unsigned Long
0xAA38	MarkTime	C28	Unsigned Long
0xAA3c	comment	C30	Char(64)

Special Reg		C160 – C199 (0x0b40 – 0x0b8f)	
Addr	Name	Name	Type
0xf000	Hardware Config	C160	Unsigned Long
0xf004	Program Config	C162	Unsigned Long
0xf008	IP Version	C164	Unsigned Long
0xf00c	Execute Register	C166	Unsigned Long
0xf010	Current File	C168	Unsigned Short
0xf012	DataTime Status	C169	Unsigned Short
0xf014	DataTime (Sec)	C170	Unsigned Short
0xf016	DataTime(Min)	C171	Unsigned Short
0xf018	DataTime(Hour)	C172	Unsigned Short
0xf01a	DataTime(day)	C173	Unsigned Short
0xf01c	DataTime(Week	C174	Unsigned Short
0xf01e	DataTime(Month)	C175	Unsigned Short
0xf020	DataTime(Year)	C176	Unsigned Short
0xf022	TempData	C177	Unsigned Short
0xf024	PLC File Sel	C178	Unsigned Long
0xf028	PLC Layer Sel	C180	Unsigned Long
0xf02c	PLC Autotxt Sel	C182	Unsigned Long
0xf030	Cor Offset X 1	C200	
0xf034	Cor Offset X 2	C201	
0xf038	Cor Offset Y 1	C202	
0xf03c	Cor Offset Y 2	C203	
0xf040	Cor Scale X 1	C204	
0xf044	Cor Scale X 2	C205	
0xf048	Cor Scale Y 1	C206	
0xf04c	Cor Scale Y 2	C207	
0xf050	Cor Matrix 0 1	C208	
0xf054	Cor Matrix 0 2	C209	
0xf058	Cor Matrix 1 1	C210	
0xf05c	Cor Matrix 2 2	C211	
0xf060	Cor Matrix 3 1	C212	
0xf064	Cor Matrix 3 2	C213	
0xf068	Cor Matrix 4 1	C214	
0xf06c	Cor Matrix 4 2	C215	