MAX 创鑫激光

▲ MFPT-100CL

▲ MFPT-120-300CL

▲ MFPT-500CL

MFPT-100-500CL 脉冲光纤激光器

使用手册

版权说明

“ ”

引 语

MFPT

，

，

MFPT

2

第一章 特性说明

MFPT-100-500CL

1060-1070 nm

MFPT-100-500CL Class 4

第二章 安全信息

1 -

Class 100W 1060nm

2-

1

2

LaserVision USA Kentek Corporation Rochwell Laser Industries

3-

1

2

3

1

2

3

4

5

6

7

8 **焦距 510mm 及以上场镜，除漆效果暂无法保证。**

9 K9 “ ”

4

AC 220VAC

5

1

2 4

5cm

3

6

1

2

3

4

5

6

7

4-

Laser Institute of America(LIA)

13501 Ingenuity Drive, Suite 128

Orlando,Florida 32826

Phone:407 380 1553,Fax: 407 380 5588

Toll Free:1 800 34 LASER

American National Standards Institute

ANSI Z136.1, American National Standard for the Safe Use of Lasers

(Available through LIA)

International Electro-technical Commission

IEC 60825-1,Edition 1.2

Center for Devices and Radiological Health

21 CFR 1040.10 - Performance Standards for Light-Emitting Products

US Department of Labor - OSHA

Publication 8-1.7 - Guidelines for Laser Safety and Hazard Assessment.

Laser Safety Equipment

Laurin Publishing

Laser safety equipment and Buyer ’ s Guides

第三章 产品描述

1-

MFPT-CL

MOPA

1064 nm

10 kW

25 Pin

1

2

3

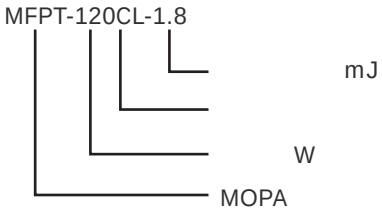
4 25 RS232

1 2

2-

MFPT-100CL	100W
MFPT-120CL	120W
MFPT-200CL	200W
MFPT-300CL	300W
MFPT-500CL	500W

品牌名称	类别种类	产品系列	系列种类	系列代码
M:MAX 激光中国芯	F:Fiber laser 光纤激光器	P: Pulsed 脉冲	空缺：默认脉宽不可调 (Q-Switch 声光调 Q)	MFP
			T: Tunable 脉宽可调	MFPT
			P:Picosecond 皮秒	MFPP
			F: Femtosecond 飞秒	MFPF
			N：Nano 小型化	MFPN



第四章 详细规格

1-

		MFPT-100CL-1.8	MFPT-120CL-1.8	MFPT-200CL-1.8	MFPT-300CL-1.8	MFPT-500CL-2	
1		&					
2		1060~1070					nm
3		100~110	120~130	200~210	300~320	450-550	W
4	(FWHM)	≤ 15					nm
5		1~4000				10~3000	KHz
6		5					m
7		≤ 1.8				≤ 2	mJ
8		65~200	65~4000	110~4000	165~4000	10~3000	KHz
9		1( ), 10~500				20~500	ns
10		5					%
11		10~100					%
12		4~6				7~9	mm
13		≥ 90					%
14	M^2/BPP	≤ 1.6					/mm·mrad
15		≤ 10					us
16		≤ 10					us
17		24	220				VAC

18		500	≤ 600	≤ 1000	≤ 1300	≤ 2000	W
19		QCS/					

*

2-

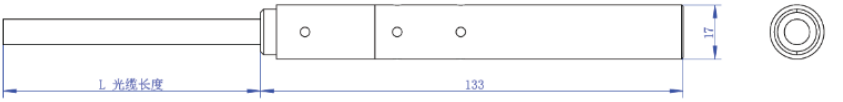
		MFPT-100CL	MFPT-120-300CL	MFPT-500CL	
1		0~40	0~40	5~40	
2		10~60	10~60	10~60	
3		10~95	10~95	10~95	%
4					
5		264*352*120	490.4*422*131.3	630*482.6*138	mm
6		12.7	25	52	kg

3-

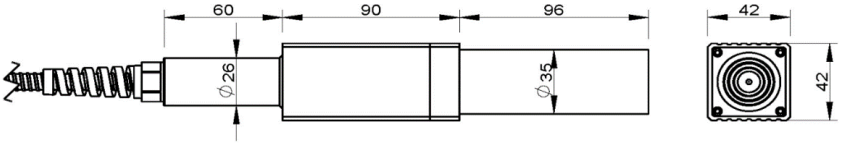
1				
2		≥ 30	30	
		24-26	20-23	
3		≥ 4		bar
4		15		L/min
5		2.5		kW

4-

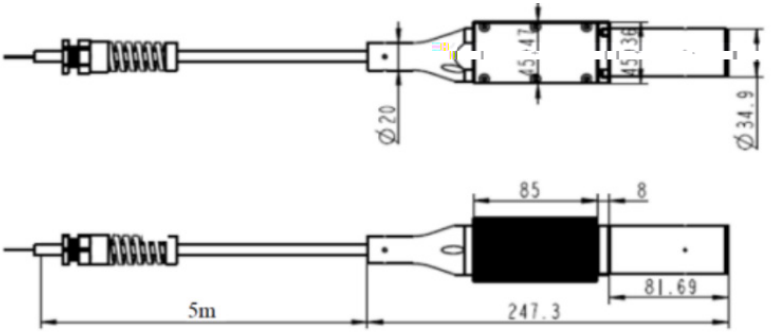
(MFPT-100~300CL) QCS mm



(MFPT-100CL) mm

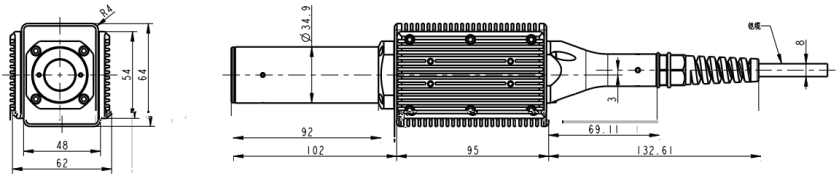


(MFPT-120~200CL) mm



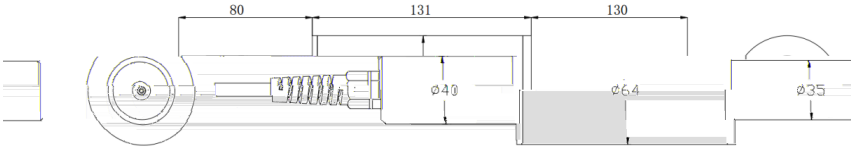
(MFPT-300CL) ( )

mm

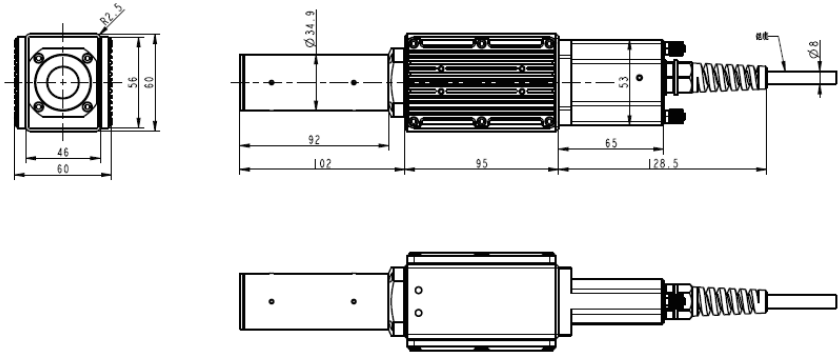


(MFPT-300CL) ( )

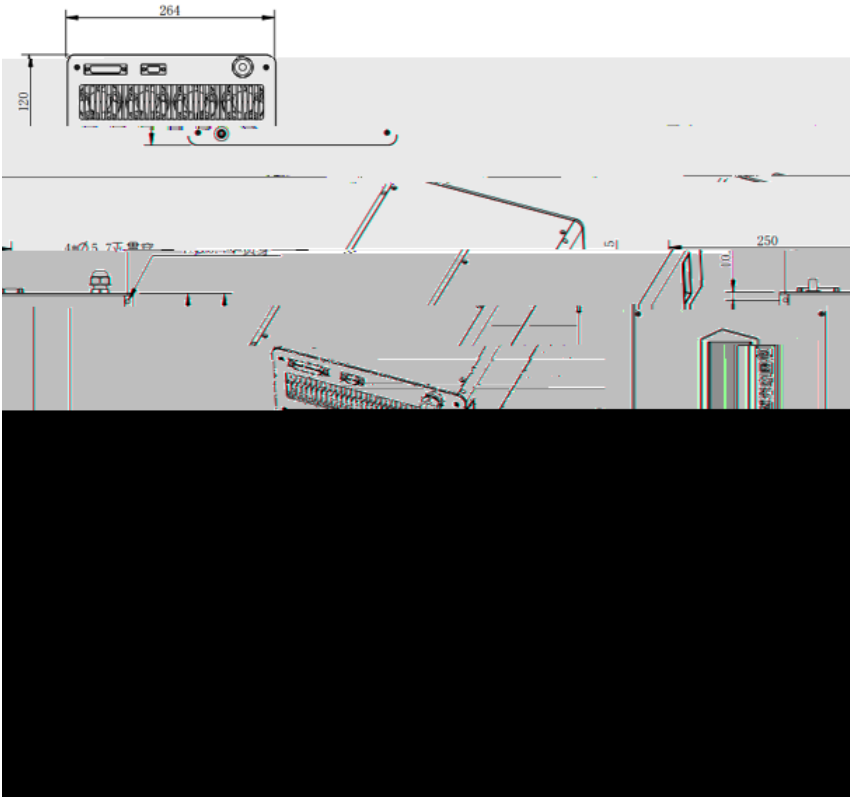
mm



(MFPT-500CL) mm



(MFP-100CL) mm



第五章 使用指南

	1

1 -DB25

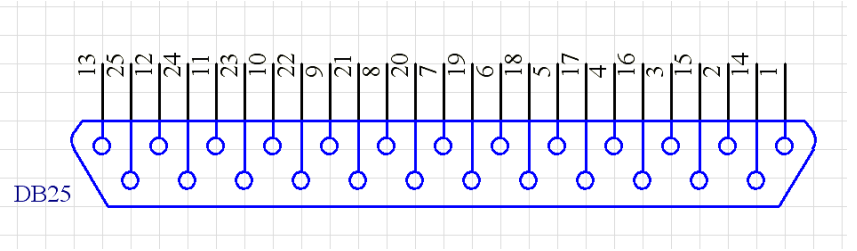
1

Pin TTL

TTL

Pin #	
1-8 D0-D7	1. 16 0-FF 10 0-255 LSB(D0) Pin1, MSB(D7) Pin8 - 00h(0): - FFh(255): - 00h.
	2. DB25.22 D1 D2

9	
14 15	
11 12 16 21	
17	+5 ± 0.25V DC
18	MO
	: MO
	: MO
19	booster /
	: booster
	: booster
20	( )
22	1. ( ) /
	2. ,
23	: :
24 25	



2 DB-25

1 DB25

2 Pin1~8 8bit Pin1 LSB Pin8 MSB Pin 0~255 0~100%

	1	2	3	4
Pin1	0	0	0	0
Pin2	0	0	0	0
Pin3	0	0	0	0
Pin4	0	0	0	0
Pin5	0	0	0	1
Pin6	0	0	1	1
Pin7	0	1	1	1
Pin8	1	1	1	1
	50%	75%	87.5%	93.75%

3 Pin 9 Pin 1~8 Pin 9 Pin 9 1μs Pin 1~8 Pin 1~9 2 μs 10 kHz

100 µs

4 Pin 11 Pin 12 Pin 16 Pin 21 Pin 11 Pin 12

Pin12	Pin11	Pin16	Pin21	
X	X	L	L	
X	X	H	L	PD
X	X	L	H	
X	X	X	X	

Pin 18 Pin 19 Pin 11 Pin 12 Pin 16 Pin 21

5 Pin 18 EE 5 ms Pin 9 EM

PCB Pin 18 Pin 18 Pin 18 PCB Pin 19 Pin 19

6 Pin 19 Pin 19 Pin 19

EE 5 ms EM EE OFF EM ON
EM ON EE ON 5ms
PCB Pin 19 EM
Pin 19 PCB Pin 18

7 Pin 20 Pin 20

0.1~0.9 0.5

8 Pin 22
Pin 22
Pin2 Pin3

Pin18
Pin19 Pin22
Pin18 Pin19 Pin22

9 Pin 23
Pin 18 Pin 19
Pin 23
Pin 18 Pin 19 2 μs

2 -

1

1

2 DB25 5.2.2

DB25

3

Pin 18 19 22	
Pin 23	
Pin 20	

4

5 220VAC 10

6 Pin 1~8 Pin 9

7 Pin 18 EE

8 5 ms

9 Pin 19 Pin 19

ON/OFF

10 ON/OFF EM OFF 500 ms

EE

11 EE EM Pin 18 Pin 19

12

2

1 Pin 20

Pin 20

2 Pin 20

Pin 20

3 Pin 1~8 Pin 9

4 Pin 18 Pin 19

5 EE ON EM OFF

6 EE ON EM ON Pin 1~8

7 Pin 22 EE EM OFF

EE EM ON

Pin 18 Pin 19 Pin 22

EE EM

8

Pin 11 Pin 12 Pin 16 Pin 21

9 Pin 16

Pin 21

3 -

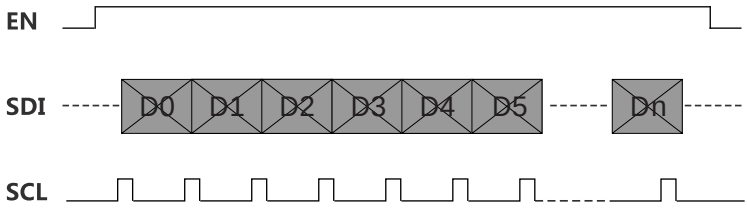
1

DB25 25 PIN1 - PIN25

DB25-PIN2 - SDI

DB25-PIN3 - SCL

DB25-PIN22- EN



EN

2

4 BYTE 32 bit

[HEAD] ->[PULSEWIDTH]

2 BYTE 2 BYTE

HEAD = 0x A501

PULSEWIDTH=

10ns, 0x A501000A 32bit

4 -

1

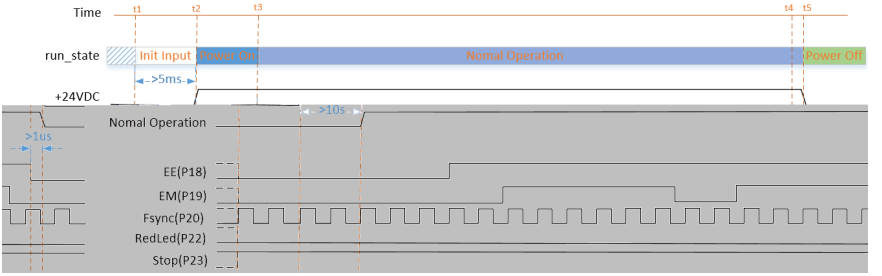
1

5 ms

10 s

2

EE 1 µs



2

1

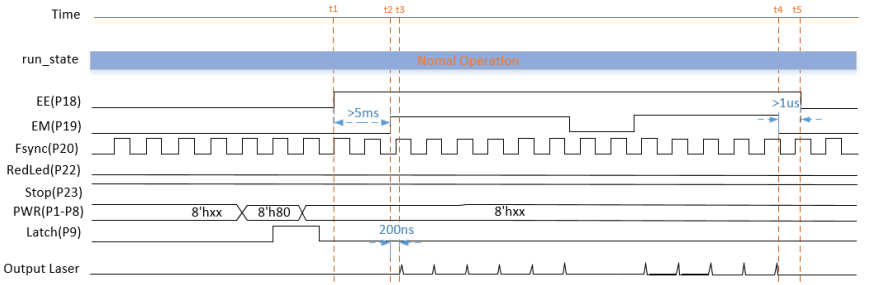
EE 5 ms EM

EM

200 ns

2

EM 1 μs EE



3

1

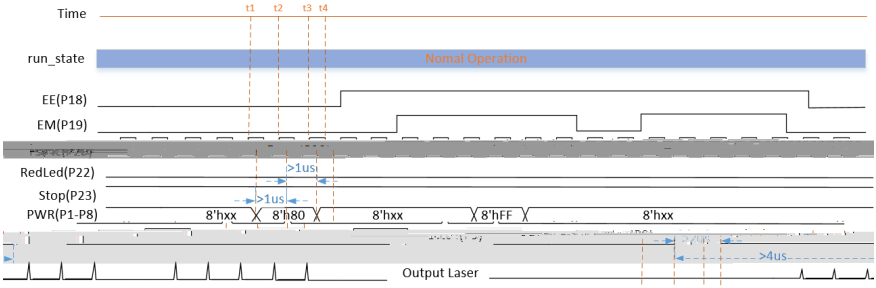
PWR 1 µs Latch

2 µs Latch PWR Latch

100 µs

2

4 µs



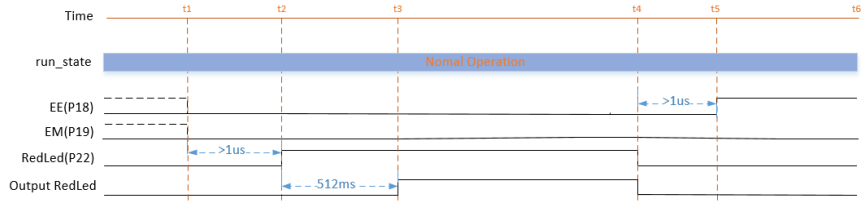
4

1

EE EM 1 µs RedLed

2

RedLed 1 µs



5 STOP

1 Stop

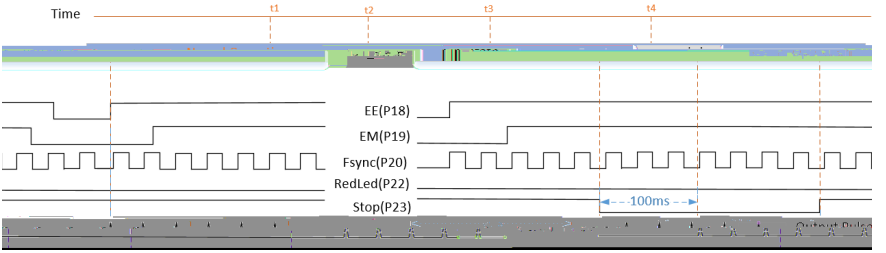
Stop Stop

100 ms

2

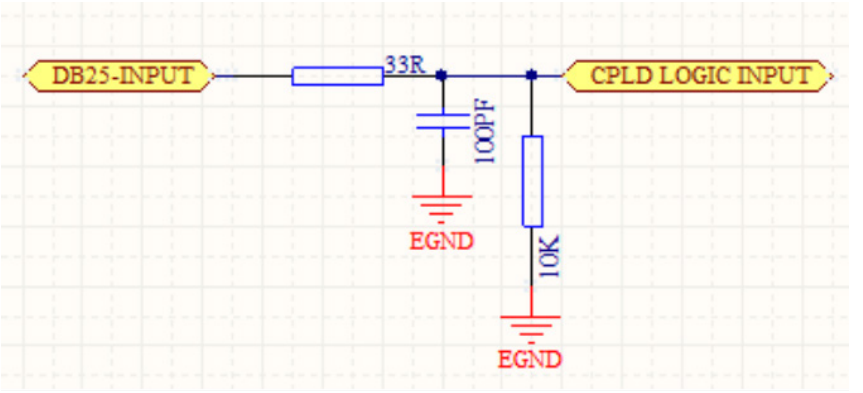
Stop

1 s



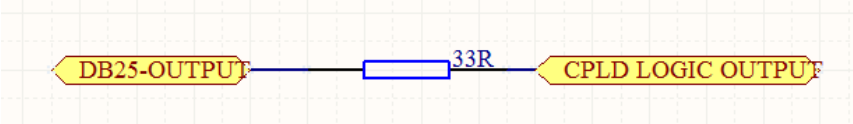
5 -

1



5 ± 2V

2



5V 10 mA

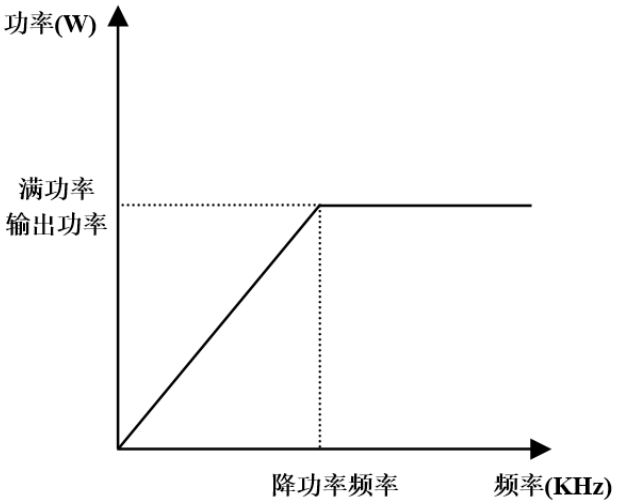
6 -

MFPT

MFPT KHZ

	ns	MFPT-100CL	MFPT-120CL	MFPT-200CL	MFPT-300CL	MFPT-500CL	
1	1	CW	CW	CW	CW	/	CW
2	10	1100	1600	2200	3000	/	4000
3	15	680	1100	1400	2500	/	3000
4	20	500	900	1050	1700	2800	3000
5	30	340	600	700	1100	2100	3000
6	40	270	430	550	850	1600	3000
7	50	230	340	450	730	1300	3000
8	60	200	280	400	620	1100	2000
9	80	170	210	350	530	950	2000
10	100	150	165	300	420	800	1000
11	120	120	145	260	350	650	1000
12	150	98	98	220	320	520	1000
13	180	85	100	185	280	450	1000
14	200	80	95	170	250	420	1000
15	220	75	88	155	240	380	900

16	250	70	82	145	220	350	900
17	300	63	75	130	200	330	700
18	350	58	68	120	185	300	600
19	400	55	65	115	175	280	600
20	450	55	65	110	165	260	500
21	500	55	65	110	165	250	500



1

2 ≥

MFPT-300CL 500 ns

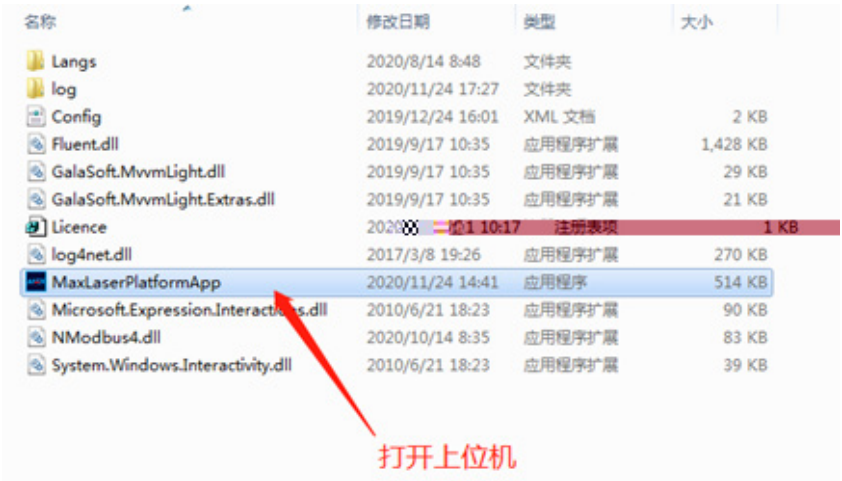
165 kHz

165 kHz 300 W

7 -

1

1 RS232



2 RS232 COM

IP IP IP

3

3.1

3.2 “ ”

“ PD ” “ ”

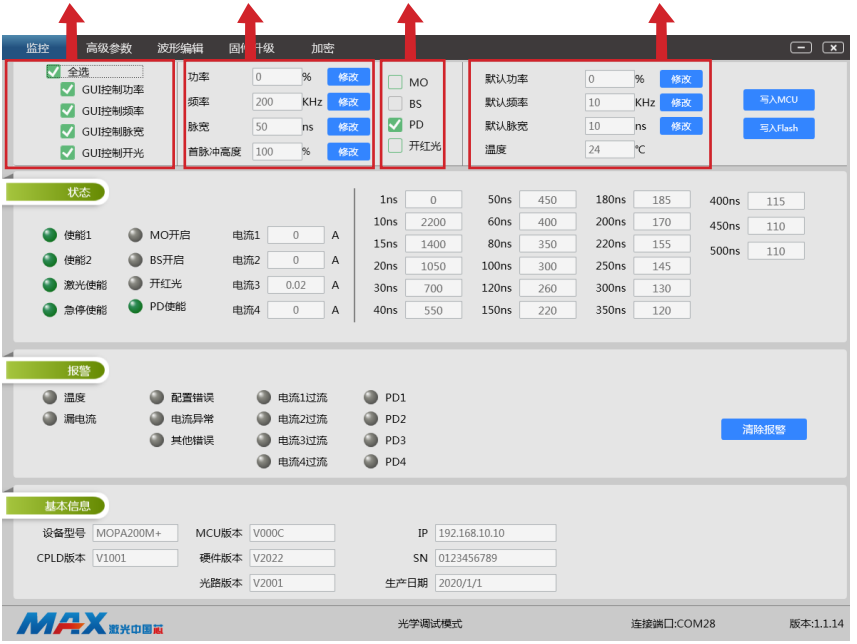
“ MO ” “ BS ”

“ PD ”

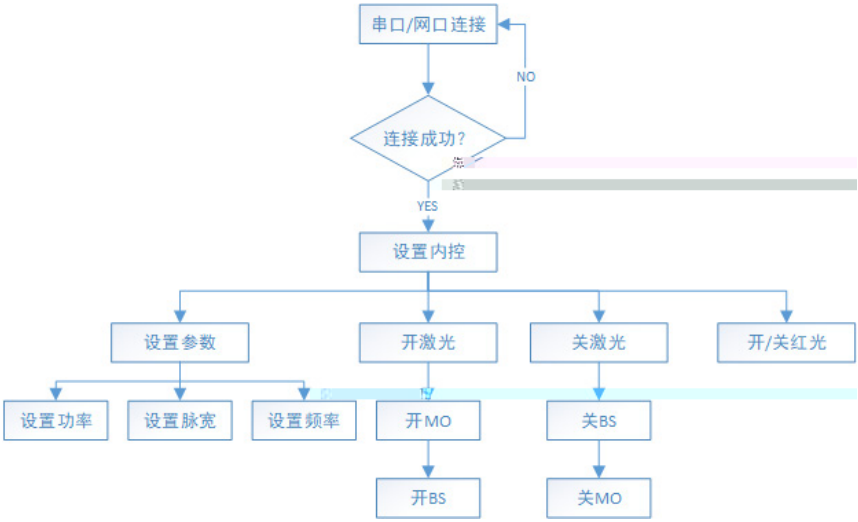
“ ”

ENTER “ ”

“ MO ”.“BS”



2



1 MO BS

2 BS

3 RS232/

8 -

1

230400

8

1

2

IP 192.168.10.10 5000

3

Modbus RTU

byte	1	1	2	N	2

1. 0x7F

2.

0x03

0x06

0x10

1 0x03

Field Name	Example(HEX)	Description
Slave Address	0x7F	
Function	0x03	
Register Address H	0x80	
Register Address L	0x00	
Register Count H	0x00	
Register Count L	0x02	
CRCH		CRC
CRCL		CRC

Field Name	Example(HEX)	Description
Slave Address	0x7F	
Function	0x03	
Byte count	0x04	
Data1 H	0x01	1
Data1 L	0x2B	1
Data2 H	0x01	2
Data2 L	0x11	2
CRCH		CRC
CRCL		CRC

2 0x03

Field Name	Example(HEX)	Description
Slave Address	0x7F	
Function	0x03	
Register Address H	0x80	
Register Address L	0x00	
Register Count H	0x00	
Register Count L	0x01	
CRCH		CRC
CRCL		CRC

Field Name	Example(HEX)	Description
Slave Address	0x7F	
Function	0x03	
Byte count	0x02	
Data1 H	0x01	
Data1 L	0x2B	
CRCH		CRC
CRCL		CRC
CRCL		CRC

3 0x06

Field Name	Example(HEX)	Description
Slave Address	0x7F	
Function	0x06	
Register Address H	0x80	
Register Address L	0x00	
Present Data1 H	0x00	
Present Data1 L	0x02	
CRCH		CRC
CRCL		CRC

Field Name	Example(HEX)	Description
Slave Address	0x7F	
Function	0x06	
Register Address H	0x80	
Register Address L	0x00	
Present Data1 H	0x00	
Present Data1 L	0x02	
CRCH		CRC
CRCL		CRC

4 0x10

Field Name	Example(HEX)	Description
Slave Address	0x7F	
Function	0x10	
Register Address H	0x80	
Register Address L	0x00	
Register Count H	0x00	
Register Count L	0x02	
Data Count	0x04	
Present Data1 H	0x01	1

Present Data1 L	0x2B	1
Present Data2 H	0x01	2
Present Data2 L	0x11	2
CRCH		CRC
CRCL		CRC

Field Name	Example(HEX)	Description
Slave Address	0x7F	
Function	0x10	
Register Address H	0x80	
Register Address L	0x00	
Register Count H	0x00	
Register Count L	0x02	
CRCH		CRC
CRCL		CRC

4 CRC

```
u16  Modbus_CRC16( u8 *puchMsg, u16 usDataLen )
{
   u8 uchCRCHi = 0xFF ; //      CRC
   u8 uchCRCLo = 0xFF ; //      CRC
   unsigned long uIndex ; // CRC

   while ( usDataLen-- ) //
   {
      uIndex = uchCRCHi ^ *(puchMsg++) ; //         CRC
      uchCRCHi = uchCRCLo ^ auchCRCHi[uIndex] ;
      uchCRCLo = auchCRCLo[uIndex] ;
   }
```

```
    return ( uchCRCHi << 8 | uchCRCLo ) ;
}

/* CRC                          */
const u8 auchCRCHi[] = {
    0x00, 0xC1, 0x81, 0x40, 0x01, 0xC0, 0x80, 0x41, 0x01, 0xC0,
    0x80, 0x41, 0x00, 0xC1, 0x81, 0x40, 0x01, 0xC0, 0x80, 0x41,
    0x00, 0xC1, 0x81, 0x40, 0x00, 0xC1, 0x81, 0x40, 0x01, 0xC0,
    0x80, 0x41, 0x01, 0xC0, 0x80, 0x41, 0x00, 0xC1, 0x81, 0x40,
    0x00, 0xC1, 0x81, 0x40, 0x01, 0xC0, 0x80, 0x41, 0x00, 0xC1,
    0x81, 0x40, 0x01, 0xC0, 0x80, 0x41, 0x01, 0xC0, 0x80, 0x41,
    0x00, 0xC1, 0x81, 0x40, 0x01, 0xC0, 0x80, 0x41, 0x00, 0xC1,
    0x81, 0x40, 0x00, 0xC1, 0x81, 0x40, 0x01, 0xC0, 0x80, 0x41,
    0x00, 0xC1, 0x81, 0x40, 0x01, 0xC0, 0x80, 0x41, 0x01, 0xC0,
    0x80, 0x41, 0x00, 0xC1, 0x81, 0x40, 0x00, 0xC1, 0x81, 0x40,
    0x01, 0xC0, 0x80, 0x41, 0x01, 0xC0, 0x80, 0x41, 0x00, 0xC1,
    0x81, 0x40, 0x01, 0xC0, 0x80, 0x41, 0x00, 0xC1, 0x81, 0x40,
    0x00, 0xC1, 0x81, 0x40, 0x01, 0xC0, 0x80, 0x41, 0x01, 0xC0,
    0x80, 0x41, 0x00, 0xC1, 0x81, 0x40, 0x00, 0xC1, 0x81, 0x40,
    0x01, 0xC0, 0x80, 0x41, 0x00, 0xC1, 0x81, 0x40, 0x01, 0xC0,
    0x80, 0x41, 0x01, 0xC0, 0x80, 0x41, 0x00, 0xC1, 0x81, 0x40,
    0x00, 0xC1, 0x81, 0x40, 0x01, 0xC0, 0x80, 0x41, 0x01, 0xC0,
    0x80, 0x41, 0x00, 0xC1, 0x81, 0x40, 0x01, 0xC0, 0x80, 0x41,
    0x00, 0xC1, 0x81, 0x40, 0x00, 0xC1, 0x81, 0x40, 0x01, 0xC0,
    0x80, 0x41, 0x00, 0xC1, 0x81, 0x40, 0x01, 0xC0, 0x80, 0x41,
    0x01, 0xC0, 0x80, 0x41, 0x00, 0xC1, 0x81, 0x40, 0x01, 0xC0,
    0x80, 0x41, 0x00, 0xC1, 0x81, 0x40, 0x00, 0xC1, 0x81, 0x40,
    0x01, 0xC0, 0x80, 0x41, 0x01, 0xC0, 0x80, 0x41, 0x00, 0xC1,
```

```
    0x81, 0x40, 0x00, 0xC1, 0x81, 0x40, 0x01, 0xC0, 0x80, 0x41,
    0x00, 0xC1, 0x81, 0x40, 0x01, 0xC0, 0x80, 0x41, 0x01, 0xC0,
    0x80, 0x41, 0x00, 0xC1, 0x81, 0x40
} ;
```

38

```
/* CRC                          */
const u8 auchCRCLo[] = {
    0x00, 0xC0, 0xC1, 0x01, 0xC3, 0x03, 0x02, 0xC2, 0xC6, 0x06,
    0x07, 0xC7, 0x05, 0xC5, 0xC4, 0x04, 0xCC, 0x0C, 0x0D, 0xCD,
    0x0F, 0xCF, 0xCE, 0x0E, 0x0A, 0xCA, 0xCB, 0x0B, 0xC9, 0x09,
    0x08, 0xC8, 0xD8, 0x18, 0x19, 0xD9, 0x1B, 0xDB, 0xDA, 0x1A,
    0x1E, 0xDE, 0xDF, 0x1F, 0xDD, 0x1D, 0x1C, 0xDC, 0x14, 0xD4,
    0xD5, 0x15, 0xD7, 0x17, 0x16, 0xD6, 0xD2, 0x12, 0x13, 0xD3,
    0x11, 0xD1, 0xD0, 0x10, 0xF0, 0x30, 0x31, 0xF1, 0x33, 0xF3,
    0xF2, 0x32, 0x36, 0xF6, 0xF7, 0x37, 0xF5, 0x35, 0x34, 0xF4,
    0x3C, 0xFC, 0xFD, 0x3D, 0xFF, 0x3F, 0x3E, 0xFE, 0xFA, 0x3A,
    0x3B, 0xFB, 0x39, 0xF9, 0xF8, 0x38, 0x28, 0xE8, 0xE9, 0x29,
    0xEB, 0x2B, 0x2A, 0xEA, 0xEE, 0x2E, 0x2F, 0xEF, 0x2D, 0xED,
    0xEC, 0x2C, 0xE4, 0x24, 0x25, 0xE5, 0x27, 0xE7, 0xE6, 0x26,
    0x22, 0xE2, 0xE3, 0x23, 0xE1, 0x21, 0x20, 0xE0, 0xA0, 0x60,
    0x61, 0xA1, 0x63, 0xA3, 0xA2, 0x62, 0x66, 0xA6, 0xA7, 0x67,
    0xA5, 0x65, 0x64, 0xA4, 0x6C, 0xAC, 0xAD, 0x6D, 0xAF, 0x6F,
    0x6E, 0xAE, 0xAA, 0x6A, 0x6B, 0xAB, 0x69, 0xA9, 0xA8, 0x68,
    0x78, 0xB8, 0xB9, 0x79, 0xBB, 0x7B, 0x7A, 0xBA, 0xBE, 0x7E,
    0x7F, 0xBF, 0x7D, 0xBD, 0xBC, 0x7C, 0xB4, 0x74, 0x75, 0xB5,
```

0x77, 0xB7, 0xB6, 0x76, 0x72, 0xB2, 0xB3, 0x73, 0xB1, 0x71,
0x70, 0xB0, 0x50, 0x90, 0x91, 0x51, 0x93, 0x53, 0x52, 0x92,
0x96, 0x56, 0x57, 0x97, 0x55, 0x95, 0x94, 0x54, 0x9C, 0x5C,
0x5D, 0x9D, 0x5F, 0x9F, 0x9E, 0x5E, 0x5A, 0x9A, 0x9B, 0x5B,
0x99, 0x59, 0x58, 0x98, 0x88, 0x48, 0x49, 0x89, 0x4B, 0x8B,
0x8A, 0x4A, 0x4E, 0x8E, 0x8F, 0x4F, 0x8D, 0x4D, 0x4C, 0x8C,
0x44, 0x84, 0x85, 0x45, 0x87, 0x47, 0x46, 0x86, 0x82, 0x42,
0x43, 0x83, 0x41, 0x81, 0x80, 0x40
};

5 MFPT-CL MODBUS

		short	W/R		
	25	1	R	PD bit4 bit[3:0]	7F03001900015FD3 7F03027800B24E
	30000	1	R		7F03753000019417 7F0302000A1049 10ns
	30001	1	R	0-255 255 100% 0 0%	7F0375310001C5D7 7F03020000904E 0

	30002	2	R	1-4000kHz =100000/	7F037532000275D6 7F0304271000006F45 0x00002710 10000 10kHz
GUI/ DB25	30025	1	W/R	Bit0 / (1 GUI 0 DB25) Bit1 (1 GUI 0 DB25) Bit2 (1 GUI 0 DB25) Bit3 (1 GUI 0 DB25)	7F037549000145CE 7F03020000904E DB25 GUI 7F067549000F080A 7F067549000F080A GUI
	30026	1	W	0-255 255 100% 0 0%	20% 7F06754A0033F81B 0033 7F06754A0033F81B
	30027	2	W	1-4000kHz =100000/ MO BS	100KHz 7F10754B000204 03E80000F2E7 03E80000 03E8 0000 7510754B00022166

	30028	1	W	MO BS	100ns 7F06754D00640824 0064 7F06754D00640824
MO	30030	1	W/R	OFF 0x0000 ON 0x0001	7F06754E0001380F 7F06754E0001380F MO
BS	30031	1	W/R	OFF 0x0000 ON 0x0001	7F06754F000169CF 7F06754F000169CF BS
PD	30032	1	W/R	OFF 0x0000 ON 0x0001	7F06755000015809 7F06755000015809 PD
	30033	1	W/R	OFF 0x0000 ON 0x0001	7F067551000109C9 7F067551000109C9
	40004	1	R		7F039C440001E051 7F0302001D5047 0x001D 29

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5 DB25

6 PIN18 PIN19

7 5.2 DB25

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5 2

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