SML-MA2 系列线缆光纤测试仪

使用说明书

SML-MA2 Series Cable Fiber Tester

Instruction Manual

一、 产品接口

Product Interface

接收器探头

网线测线端口

电话线（RJ11）

红光源

光功率计

网线寻线端口

灵敏度旋钮

开关

power

Network Cable Tester

远端网线端口
远端电话线端口

二、产品介绍 Product Presentation

　　SML-M2 系列线缆光纤测试仪是杉木林公司针对市场需求精心研发的一系列多功能 LCD 测试仪产品，主要用于网线、电话线、同轴电缆和其他金属线缆的连通、寻线和长度测试以及针对光纤寻线和光功率大小的测试。该系列测试仪主要有 SML-M2、SML-MP2、SML-MA2 三款，他们的功能各不相同，用户可根据自己的需求选取最适合自己的性价比最高的产品。

　　The SML-M2 series cable and fiber optic tester is a range of multi-functional LCD testing devices carefully developed by the Shamu Lin Company to meet market demands. They are primarily used for continuity testing, line tracing, length measurement of network cables, telephone lines, coaxial cables, and other metallic cables, as well as

fiber optic tracing and measurement of optical power levels. This tester series consists of three models: SML-M2, SML-MP2, and SML-MA2, each offering different features. Users can choose the most cost-effective product that best suits their specific needs.

2.1 产品功能 Product Function

功能 Function	SML-M2	SML-MP2	SML-MA2
1、连通测试 Mapping Test	√	√	√
2、长度测试 Length Test	网线长度	网线长度	√
3、断点测试 Breakpoint Test	网线断点	网线断点	√
4、寻线测试 Scanning Test	√	√	√
5、光功率计 Optical Power Meter Test	√	√	√
6、红光源 Red Light Resource		√	√
7、电量显示 Battery Indicator Test	√	√	√
8、自检自调 Self-test And Self-adjusting	√	√	√
9、背光时间可调 Back Light Time Is Adjustable	√	√	√
10、关机时间可调 Shutdown Time Is Adjustable	√	√	√

1、连通测试：测试线缆的开路、短路、跳线、反接、交叉、配对等；

　　Mapping Test:Test cable short circuit fault, open circuit, jumper, reverse connection, cross, matching, etc.;

2、长度测试：测量线缆长度；

　　Length Test:Measure the cable length;

3、断点测试：测量线缆断点的长度；

　　Breakpoint Test:Measure the length of the cables breakpoint;

4、寻线测试：通过音频信号，在线堆中寻找待测线缆，可交换机带电寻线；

　　Scanning Test:Through audio signal, the heap online to find under test is the line, can switch electric line;

5、光功率计：测试光纤的对数功率（dBm）、线性功率（nw）或相对功率（dB）；

　　Optical Power Meter Test:Test the logarithm of the fiber power (dBm), linear power (nw) or relative power (dB);

6、红光源：自带 650nm 功率 10mW（寻线长度 10~12km）的红光源（可定制）；

　　Red Light Resource:Bring their own power of 10mw 650 nm (length 10~12 km) of red light source (customizable);

7、电量显示：用四格电池符号显示当前电量；

　　Battery Indicator Test:With four battery symbol displays the current capacity;

8、自检自调：自动检测调节各种测试情形，对电池容量及环境温度变化自动补充；

　　Self-test And Self-adjusting:Automatic detection to adjust various test cases, temperature changes automatically added to the battery capacity and the environment;

9、背光时间可调：可以根据自己的需求调节背光时间；

　　Back Light Time Is Adjustable:Can according to their own needs to adjust the back light time;

10、关机时间可调：可以根据自己的需求选择关机时间。

　　Shutdown Time Is Adjustable:Can choose according to their own requirements shutdown time.

2.2 产品配件 Product Accessories

在您拿到杉木林 M2 系列产品后，请检查下各个标准配件是否齐全。

After receiving the M2 series products from SHOMLIN, please check if all the standard accessories are complete.

仪器配件：1、测试仪主机；2、寻线器；3、远端副机；4、鳄鱼夹适配线；5、RJ11-BNC 转接线；6、9V 叠层电池；7、工具包；8、彩盒；9、说明书。

Instrument Accessories:

1. Tester mainframe

2. Cable tracer

3. Remote unit

4. Alligator clip adapter cable

5. RJ11-BNC adapter cable

6. 9V stacked battery

7. Tool kit

8. Colorful box

9. User manual.

2.3 技术参数 Technical Parameters

名称 Designation	SML-M2 系列线缆光纤测试仪　SML-M2 Series Cable Fiber Tester
显示 Display	LCD 点阵 128x64　LCD dot matrix 128x64
电源 Power	9V 叠层电池　9V laminated battery/3.7V 1000mAh 锂电池
包装 Packaging	工作包+彩盒　Tool bag+color box
工作环境温度 Operating Temperature	-10℃~+60℃
工作环境湿度 Operating Humidity	10%~70%
材质 Material	ABS
总包装尺寸 Package Size	270*180*70mm
总重量 Weight	450g
线缆测试参数　Cable Test Parameters	
可测试线材 Testable Material	5E、6E 双绞网线、电话线以及其他金属线 5E、6E twisted pair、telephone wire and other metal wire
端口 Port	RJ45、RJ11
测量线缆长度 Measurable Length	1-1200 米(1-1200 meters)
寻线长度 Scanning Length	大于 3000 米(More than 3000 meters)
光功率计参数 Optical Power Meter Parameter	
标准波长 Standard Wavelength	850nm、980nm、1300nm、1310nm、1490nm、1550nm
可测波长范围 Measurable Wavelength	800nm-1600nm
测量范围 Measurable Range	-70dBm~+3dBm

显示分辨率 Resolution Ratio	线性显示 0.1%，对数显示 0.01dBm Linear 0.1%,logarithm 0.01dBm
测量灵敏度 Measuring Sensitivity	0.01nw
探头类型　Probe Type	1nGaAs
红光源（可定制） Red Light Resource (Customizable)	650nm 5mW 可见激光光源 650nm 5mW visible laser light source
红光寻线长度 Length Of Red Light	5km~8km

三、操作说明 **Operation Instructions**

按主机"ON/OFF"开机，3 秒以后显示主菜单。

Press the host "ON/OFF" to start the instrument, 3 seconds later according to the main menu.

3.1 线缆接线方式 Connection Mode

3.1.1 双绞线 Twisted-pair

1、M-S 方法：线缆两端分别接入主机的 M 和 S 端口；

M-S Method:Cable ends respectively connected to the host of the M and S port;

2、M-R 方法：线缆两端分别接入主机的 M 端口和副机的 RJ45 端口；

M-R Method: At both ends of the cable are respectively connected to the host's M port and vice board RJ45 port;

3、Open 方法：线缆一端接入主机的 M 端口，另一端无需连接。

Open Method: Cable at one end connected to the host M port, the other end without connection.

3.1.2 电话线 Telephone Line

1、RJ11-RJ11 方法：电话线两端分别接入主机和副机的 RJ11 端口；

RJ11-RJ11 Method: Telephone lines at both ends respectively connected to the host and vice board RJ11 port;

2、Open 方法：线缆一端接入主机的 RJ11 端口，另一端无需连接。

Open Method: Telephone line at one end connected to the host RJ11 port,the other end without connection.

3.1.3 同轴线 Coaxial Line

1、Open 方法：使用 RJ11-BNC 转接线一端接入主机的 RJ11 口，另外一端接入待测同轴线，另一端无需连接。

Open Method: Use RJ11-BNC adapter at one end connected to the host RJ11 port and the other end connected to the coaxial line under test, the other end without connection.

3.2 线缆连通测试 Wire Mapping Test

测试方法 Test Method

按上下键选择"连通测试"，按"ENTER"进入连通测试后，按上下键选择待测线缆类型："双绞线"或"电话线"（注：同轴线或其他两芯线也在电话线选项测试）。

Press up or down key to choose "Wire mapping", press "ENTER" to enter "Wire mapping",
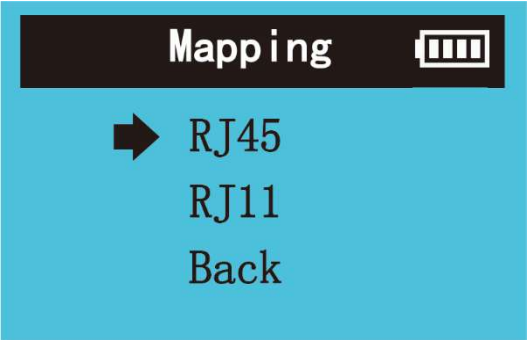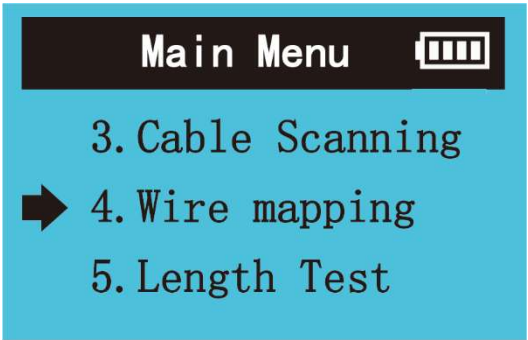
press up or down key choice for the cable type: "RJ45" or "RJ11" (note: coaxial line or other two-core wire in RJ11 option test).

将双绞线按照 M-S 方法或 M-R 方法连接好，选择"双绞线"选项，按"ENTER"开始测试。

Connect cables according to the M-S or M-R method, choose "RJ45", press "ENTER" to start test.
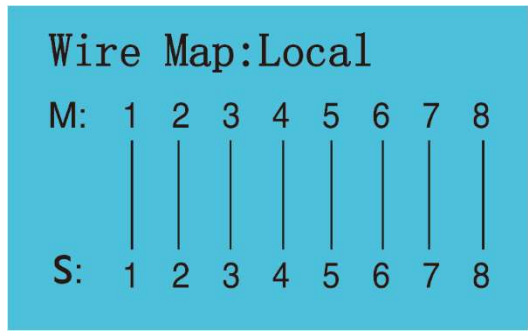
将电话线按照 RJ11-RJ11 方法连接好，选择"电话线"选项，按"ENTER"开始测试。

Connect telephone line according to the RJ11-RJ11 method, choose "RJ11", press "ENTER" to start test.
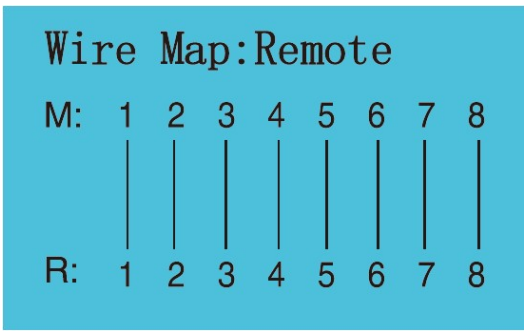
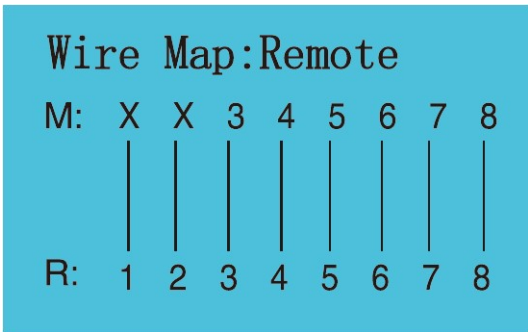| Main Menu 🔋	Mapping 🔋
3. Cable Scanning ➡ 4. Wire mapping 5. Length Test	➡ RJ45 RJ11 Back

以双绞线测试为例显示如下：

Cable testing, for example shows as follows:

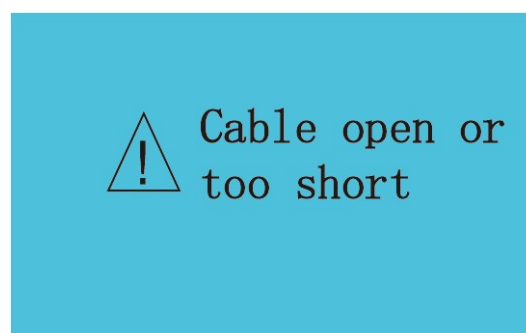| Wire Map:Local M: 1 2 3 4 5 6 7 8 S: 1 2 3 4 5 6 7 8	Wire Map:Remote M: 1 2 3 4 5 6 7 8 R: 1 2 3 4 5 6 7 8
M-S 方式测试结果：正常 M - S mode test result: NORMAL	M-R 方式测试结果：正常 M - R mode test result: NORMAL
Wire Map:Remote M: X X 3 4 5 6 7 8 R: 1 2 3 4 5 6 7 8	Wire Map:Remote M: X 2 3 4 5 6 7 8 R: X 2 3 4 5 6 7 8
M 端 12 位置开路 M port 1 and 2 positions open	线缆 1 位置中部开路 Cable 1 central position open
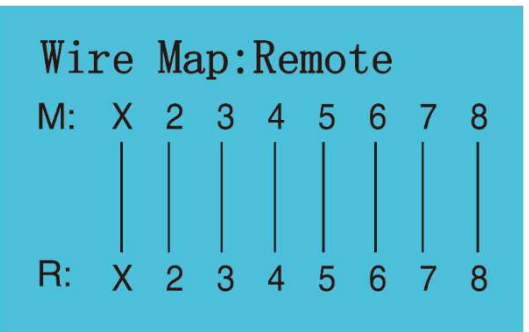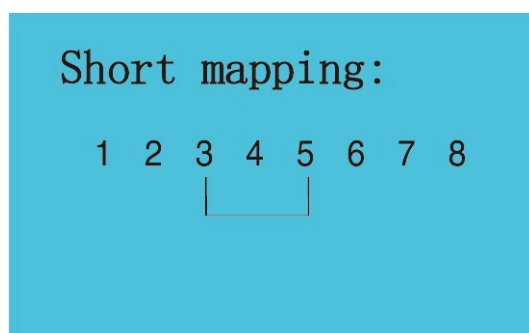
位置 3 和 5 处短路
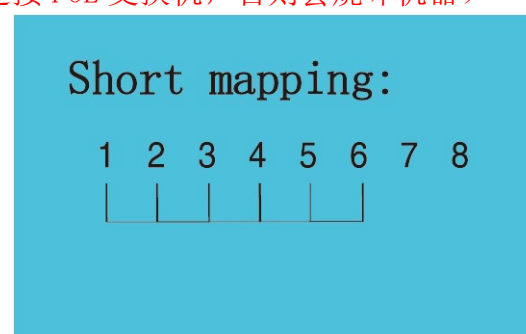short-circuiting at positions 3 and 5

线缆未接好或过短
Cable is not connected or too short

本机与非 POE 交换机连通测试：（不能连接 POE 交换机，否则会烧坏机器）
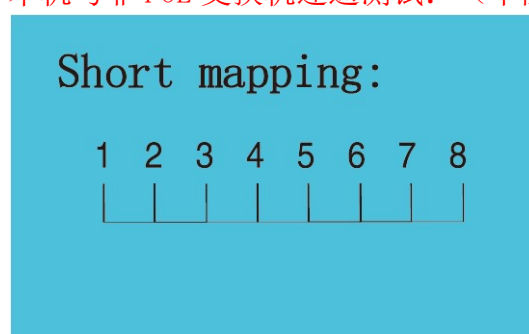
交换机该端口状况良好
The port of the switch is in good condition

交换机该端口 7 号和 8 号线断路
The port of the switch 7 and 8 line core disconnect

3.3 线缆长度测试 Cable Length Test

测试方法 Test Method

在主菜单界面按上下键选择"长度测试"，按"ENTER"进入长度测试后，按上下键选择待测线缆类型："双绞线"或"电话线"（注：同轴线使用 RJ11-BNC 转接线或其他两芯线也使用电话线选项测试）。
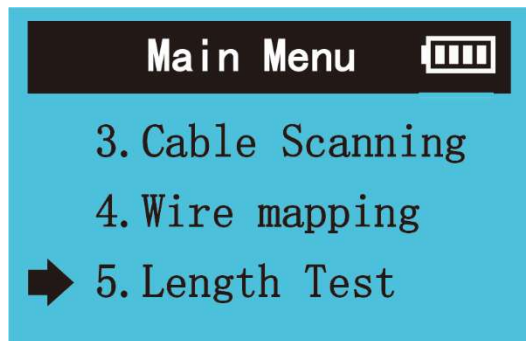
On the main menu screen, use the up and down keys to select "Length Test," then press "ENTER" to enter the length test. Once in the length test, use the up and down keys to select the type of cable to be tested: "Twisted Pair" or "Telephone Line" (Note: Coaxial cables using RJ11-BNC adapters or other two-core wires should also be tested using the telephone line option).

将双绞线按照 M-S 方法、M-R 方法或 Open 方法连接好，选择"双绞线"选项，按"ENTER"开始测试。

Connect the twisted pair according to the M-S method, M-R method, or Open method. Select the "twisted pair" option and press "ENTER" to start the test.

将电话线按照 RJ11-RJ11 方法或 Open 方法连接好，选择"电话线"选项，按"ENTER"开始测试。

Connect the telephone line using the RJ11-RJ11 method or the Open method, select the "telephone line" option, and press "ENTER" to start the test.

```
┌─────────────────────────────┐
│ ██ Main Menu    ▐▌▌▌▌ │
│                             │
│   3.Cable Scanning          │
│   4.Wire mapping            │
│ ➡ 5.Length Test             │
│                             │
└─────────────────────────────┘
```

```
┌─────────────────────────────┐
│ ██ Lenth Test   ▐▌▌▌▌ │
│                             │
│ ➡   RJ45                    │
│     RJ11                    │
│     Back                    │
│                             │
└─────────────────────────────┘
```

以网线测试为例显示如下：

Cable testing, for example shows as follows:

```
┌─────────────────────────────┐
│                             │
│ 1 2 M-S      99.9m          │
│ 3 6 M-S     100.1m          │
│ 4 5 M-S      99.8m          │
│ 7 8 M-S     100.1m          │
│                             │
└─────────────────────────────┘
```

M-S 测试方式结果：正常

M - S mode test result: NORMAL

```
┌─────────────────────────────┐
│                             │
│ 1 2 M-R      99.9m          │
│ 3 6 M-R     100.1m          │
│ 4 5 M-R      99.8m          │
│ 7 8 M-R     100.1m          │
│                             │
└─────────────────────────────┘
```

M-R 测试方式结果：正常

M - R mode test result: NORMAL

```
┌─────────────────────────────┐
│                             │
│ 1 2  Open    99.9m          │
│ 3 6  Open   100.1m          │
│ 4 5  Open    99.8m          │
│ 7 8  Open   100.1m          │
│                             │
└─────────────────────────────┘
```

Open 测试方式结果：正常

Open mode test result: NORMAL

```
┌─────────────────────────────┐
│                             │
│ 1 2  Open    99.9m          │
│  3   Open    40.1m          │
│  6   Open    99.0m          │
│ 4 5  Open    99.8m          │
│                             │
└─────────────────────────────┘
```

此线缆第 3 芯在 40m 处断掉
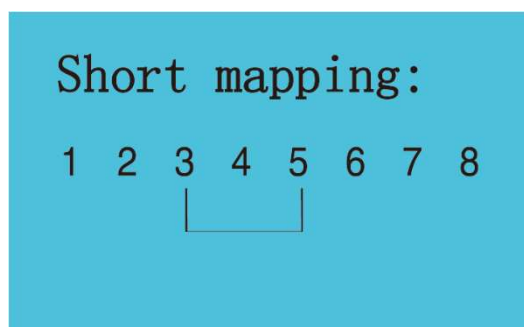
线缆 3 和 5 位置短路

Cable position 3 and 5 short circuit

说明：

如图所示， "M-S""M-R""开路"后面对应的数字即为当前测试线缆的长度。

Description:

As shown, "M - S" "M - R" "open" behind the corresponding figures for the current test cable length.

3.4 线缆参数校准与调取 Proofread And Obtaining Of The Cable Parameters

线缆参数的校对与调取的背景：由于市面上线缆的材质很多都是非标线材，直接测试时由于线材不同的原因会导致测试长度的结果会有一定的误差，为了保证线缆长度的精确度，实际测试前会要求用同材质的线缆进行校准。

Verification and Retrieval of Cable Parameters: Background: Due to the fact that many cables available in the market are non-standard, direct testing can result in certain errors in the measured length due to variations in cable materials. To ensure the accuracy of cable length, it is necessary to calibrate with cables of the same material before conducting actual tests.
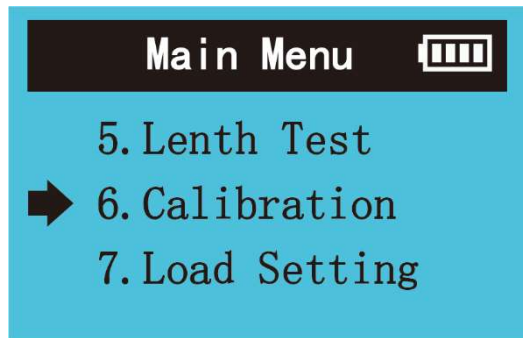
测试方法 Test Method

按上下键选择"线缆长度校准"，按"ENTER"进入线缆长度校准测试后，按上下键选择待测线缆类型："双绞线"或"电话线"（注：同轴线或其他两芯线也使用电话线选项测试）。

Use the up and down arrows to select "Cable Length Calibration." Press "ENTER" to enter the cable length calibration test. Then, use the up and down arrows to select the type of cable to be tested: "Twisted Pair" or "Telephone Line" (Note: Coaxial cables or other two-core cables are also tested using the Telephone Line option).
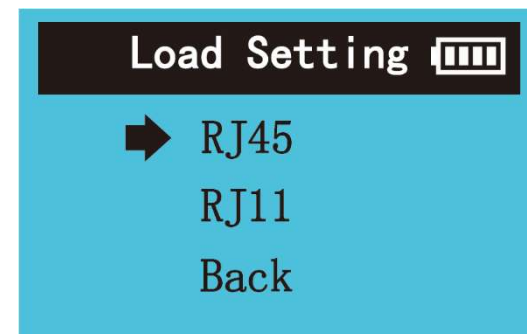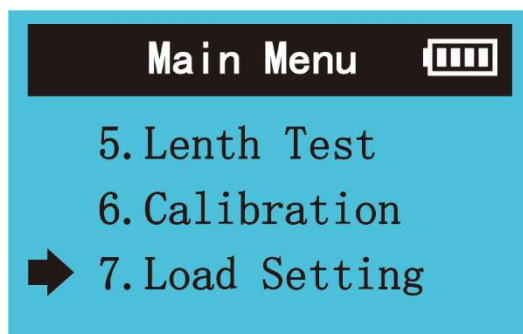
校准方法：用一根与待测线缆相同材质且已知长度（10 米或 10 米以上）的线缆进行参数校准测试。按上下键将测试结果调整到已知长度线缆的实际长度，然后按"ENTER"保存至存储单元（1、2 或 3）。
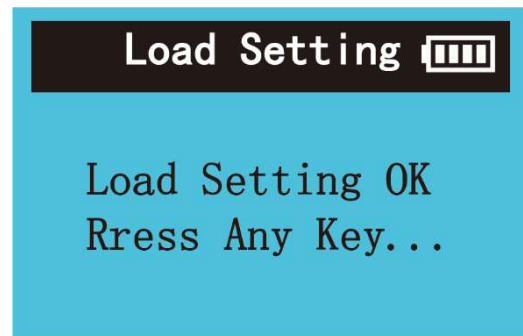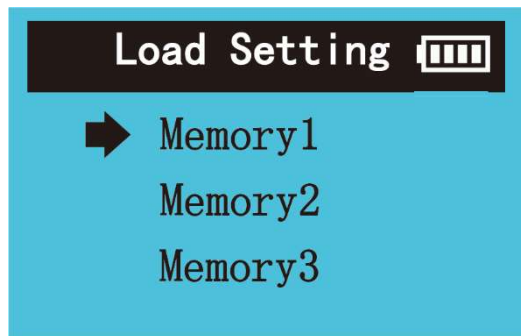
Calibration method: Use a cable of the same material as the cable under test and of a known length (10 meters or more) to perform parameter calibration testing. Adjust the test results to the actual length of the known length cable using the up and down keys, and then press "ENTER" to save it to the storage unit (1, 2, or 3).

```
Main Menu        [====]
  5. Lenth Test
➡ 6. Calibration
  7. Load Setting
```

```
Calibration [====]
➡ RJ45
  RJ11
  Back
```

```
——Base Adjust——

        11.3m
```

```
Calibration [====]
➡ Memory1
  Memory2
  Memory3
```

```
Calibration [====]


  Base adjust ok!
```
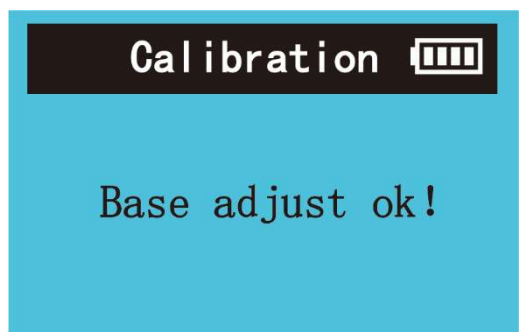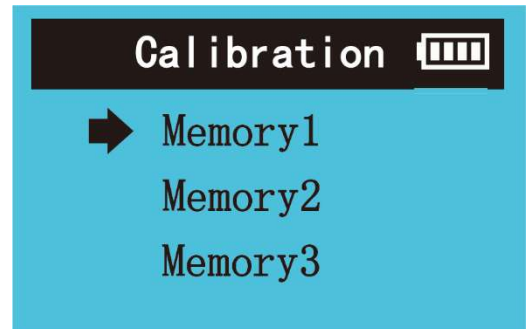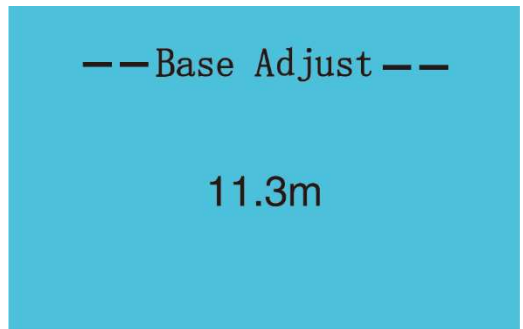
参数保存成功后，在"线缆参数调取"选项中调取出存储单元（1、2 或 3）中已存好的参数。调取成功后再进行待测线缆的长度测试，测试结果会更精确。

After successfully saving the parameters, retrieve the stored parameters from storage unit (1, 2, or 3) in the "Cable Parameter Retrieval" option. Once retrieval is successful, proceed with the length testing of the cable under measurement for more accurate test results.

```
Main Menu        [====]
  5. Lenth Test
  6. Calibration
➡ 7. Load Setting
```

```
Load Setting [====]
➡ RJ45
  RJ11
  Back
```

3.5 线缆寻线测试 Cable Scanning Test

接线方式 Connection Mode

双绞线：双绞线一端接入主机的 S 端口另一端不接或接至交换机；

Twisted pair: Cable at one end connected to the host S port, on the other side is not connected or connection switch;

电话线：电话线一端接入主机的 RJ11 端口另一端不接；（注：同轴线或其他两芯线也使用电话线选项测试）

Telephone Line: Telephone line at one end connected to the host RJ11 port, the other end does not connected;(note: coaxial line or other two-core wire in the telephone option test).

操作方式 Test Method

在主菜单界面按上下键选择"线缆寻线"，按"ENTER"进入寻线测试后，LCD 显示屏上显示"寻线中…"，然后插上待寻线线缆，打开寻线器电源开关，指示灯长亮，开始寻线，手持寻线感应器测试待测线缆另一端，调节寻线感应器灵敏度，贴近线缆时发出"嘟嘟"提示音的线就是要寻的线缆。

On the main menu screen, use the up and down keys to select "Cable Tracing," and press "ENTER" to enter the tracing test. The LCD display will show "Tracing in progress...". Next, plug in the cable to be traced, turn on the power switch of the tracer, and the indicator light will stay on steadily, indicating that the tracing has started. Hold the tracing sensor and test the other end of the cable to be tested. Adjust the sensitivity of the tracing sensor. The cable that emits a "beep" sound when it is close to the sensor is the one to be traced.
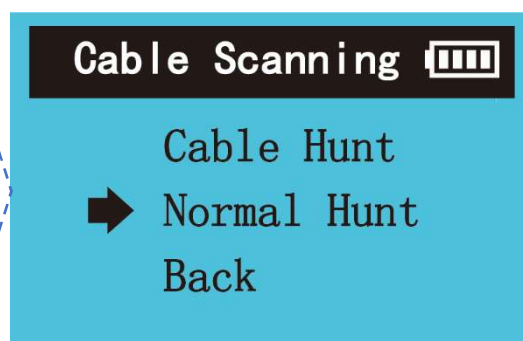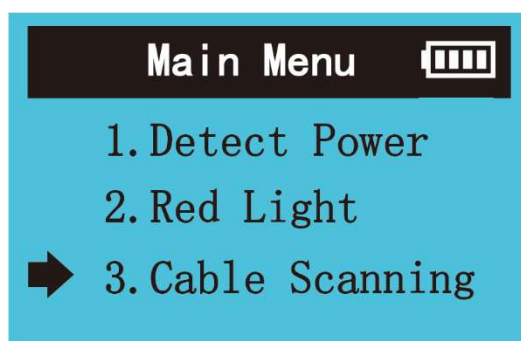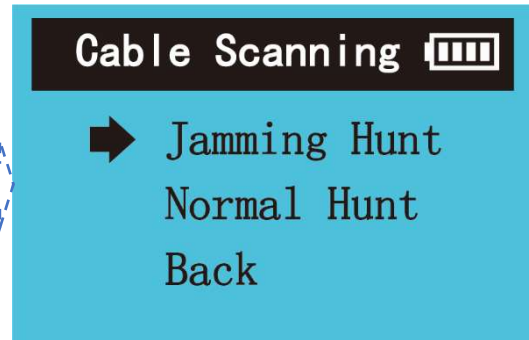

普通寻线选择位置

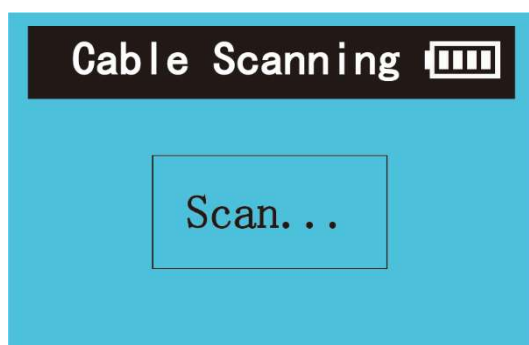Regular Line Tracing Position Selection
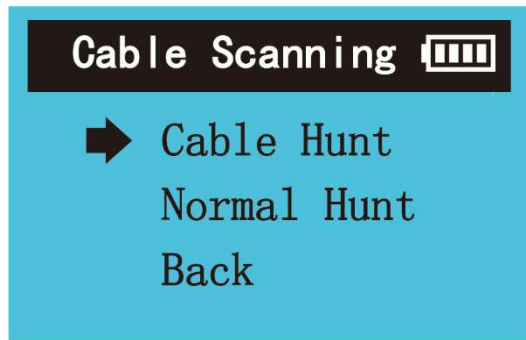
网线寻线选择位置
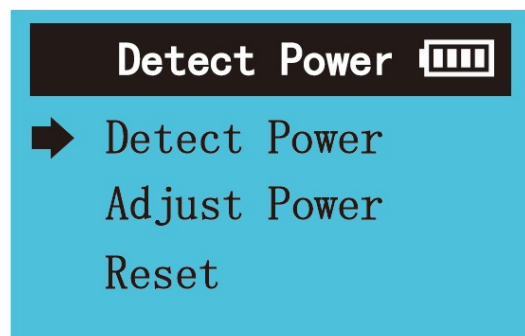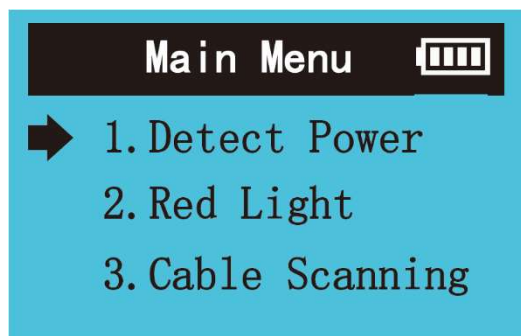Choosing the location for network cable tracing

抗干扰寻线选择位置

Anti-interference Line Tracing Position Selection

3.6 光功率计测试 Optical Power Meter Test

在主界面按上下键选择"测量实时功率"，按"ENTER"键进入"测量实时功率"界面，如下图所示。

In the main interface press up or down key select "Delect Power", press "ENTER" button to ENTER "Delect Power" of the interface, as shown in the figure below.

Detect Power:实时光功率计测试。

Adjust Power：手动校准光功率，在用户测试功率时，若数据有少量偏差，可通过"Adjust Power"进行手动校准。

Manual power calibration is performed by using "Adjust Power" to make slight adjustments when there is a small deviation in the measured power during user testing.

Reset：恢复默认参数，可将光功率数值恢复至系统初始的数值。

选择"Detect Power"，按"ENTER"键进入光功率计测试界面。

Detect Power: Real-time optical power meter test.
Adjust Power: Manually calibrate the optical power. If there is a small deviation in the data during user power testing, you can manually calibrate it using "Adjust Power".

Manual power calibration is performed by using "Adjust Power" to make slight adjustments when there is a small deviation in the measured power during user testing.

Reset: Restore default parameters and reset the optical power value to the initial system value.

Select "Detect Power" and press the "ENTER" key to enter the optical power meter test interface.
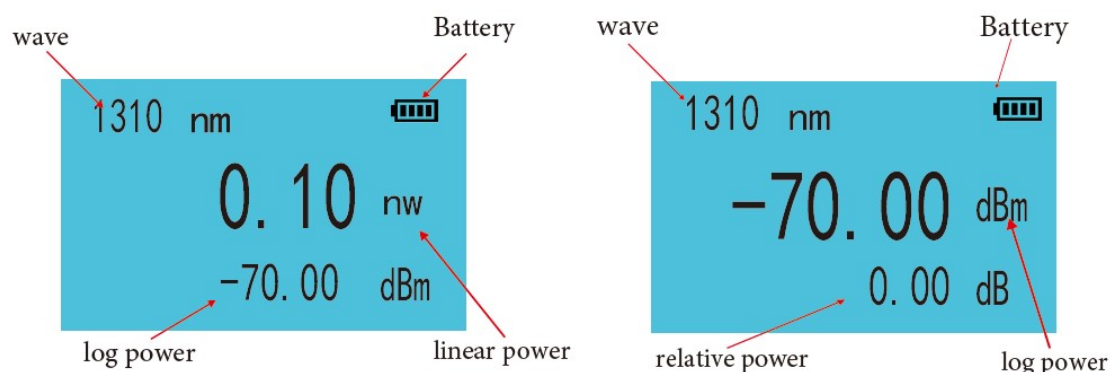
此时系统开机默认进行光功率线性和对数功率测量，如图所示。若按一次上键系统切换到相对功率测量状态，此时系统界面如图所示，即进行光功率的对数和相对功率测量。

在"测量实时功率"界面下按下键，波长将在 850nm、980nm、 1300nm、1310nm、1490nm、1550nm 六个波段中循环变化。系统开机默认为 1310nm。

At this time, the system is powered on and defaults to perform optical power linear and logarithmic power measurements, as shown in the figure. If the up button is pressed once, the system switches to relative power measurement mode, and the system interface at this time is shown in the figure, which performs logarithmic and relative power measurements of optical power.

Pressing the down button on the "Real-time Power Measurement" interface will cycle the wavelength among six bands: 850nm, 980nm, 1300nm, 1310nm, 1490nm, and 1550nm. The system defaults to 1310nm upon power-on.

3.7 光纤寻线定位 Hunting And Positioning Of Optical Fiber

在主界面按上下键选择"红光源"，按"ENTER"键进入"红光源"界面，如下图所示。

In the main interface press up or down key to choose "Red Light", press "ENTER" to enter "Red Light" interface, as shown in the figure below.
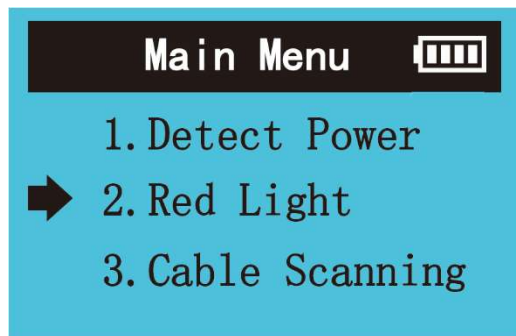
光纤寻线频率可调节，分别为 0HZ 与 1HZ，若调节为 0HZ，则红光源长亮，若频率为 1HZ，则红光源闪烁。按上下键可以调节频率。

Scanning of optical fiber frequency adjustable, 0hz and 1hz, respectively. If adjustment is 0hz, the red light display will last long time, if the frequency of 1hz, the red light blinking. Press up or down key can adjust by frequency.

待调节好红光源频率后，按"ENTER"开始进行光纤寻线定位，如下图所示：

After being adjust good red light source frequency, press "ENTER" key to positioning of optical fiber, as shown in the figure below.

在"红光源，寻线中"界面中，按"ENTER"键退出。

In the "Red Light, Scan..."interface, press "ENTER" key to exit.

将待寻找的光纤线接入本仪器，若另一端光纤能看见射出的红光，则该条光纤线为待测光纤线，并且光纤中间没有断路，若另一端没有看到红光，说明待测光纤中间已经断开。

The need to look for optical fiber access to the instrument, if the other end of the optical fiber can see red light, which fiber optic for the fiber under test line, and there is no break between optical fiber,if on the other side didn't see the red light, the fiber under test has been broken in the middle.
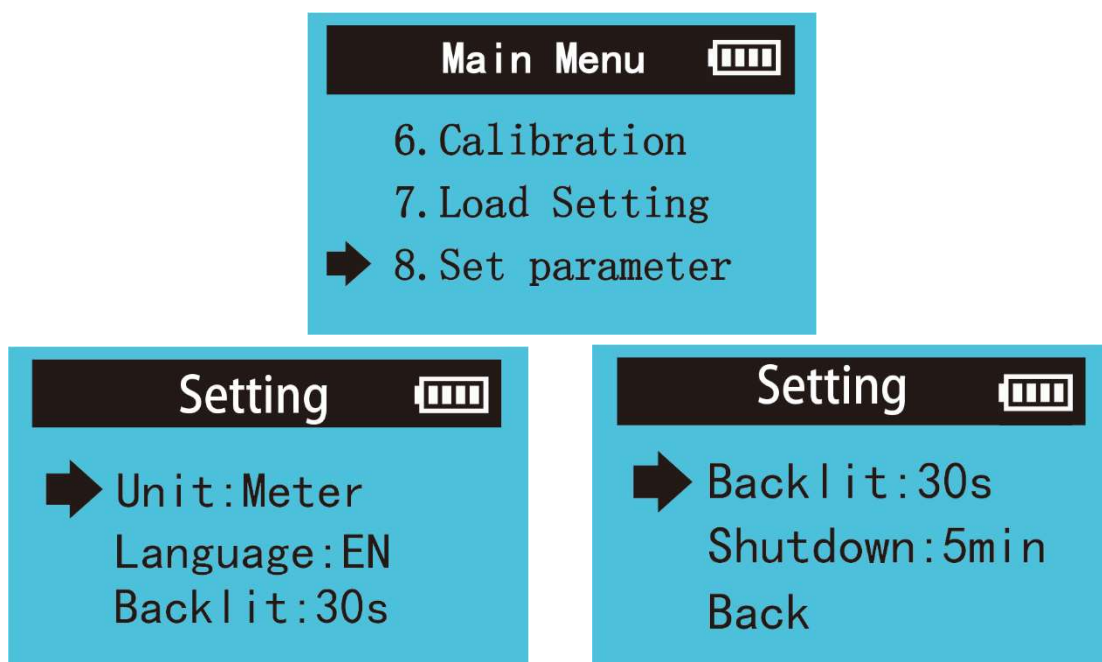
⚠警告：在寻光纤线时，切勿被本仪器射出的激光直射眼睛，会对眼睛造成伤害。

⚠WARNING:When hunting of optical fiber,please don't be the instrument of laser direct eyes, will cause harm to the eyes.

3.8 参数设定 Set Parameter

在主菜单按上下键选择"参数设定"，按"ENTER"键进入"参数设定"，显示如下图所示界面。

In the main menu press up or down key choose "Set parameter", press "ENTER" to enter "Set parameter", the display interface as shown in the figure below.

```
┌─────────────────────────────┐
│  Main Menu        ▐▂▂▂▂▌    │
│   6.Calibration             │
│   7.Load Setting            │
│ ➡ 8.Set parameter           │
└─────────────────────────────┘
```

```
┌──────────────────┐   ┌──────────────────┐
│ Setting    ▐▂▂▂▌ │   │ Setting    ▐▂▂▂▌ │
│ ➡ Unit:Meter     │   │ ➡ Backlit:30s    │
│   Language:EN    │   │   Shutdown:5min  │
│   Backlit:30s    │   │   Back           │
└──────────────────┘   └──────────────────┘
```

　　在主菜单按上下键选择"Set parameter"，按"ENTER"键进入参数设定。

　　在设置界面按上下键选择需要修改参数，按"ENTER"键修改箭头指向参数的值。

Unit：单位，可选择长度单位：米、英尺、码。

Language：语言，可选择中文和英文。

Backlit：背光时间，可调节时间有 30 秒、1 分钟、5 分钟、永不休眠。

Shutdown：关机时间，可调节时间有 5 分钟、10 分钟、30 分钟、永不休眠。

　　On the main menu, use the up and down arrow keys to select "Set parameter," and press the "ENTER" key to enter the parameter settings.

In the settings interface, use the up and down arrow keys to select the parameter you want to modify, and press the "ENTER" key to modify the value indicated by the arrow.

Unit: Unit, you can choose the length unit: meter, foot, yard.

Language: Language, you can choose Chinese and English.

Backlit: Backlight time, adjustable options are 30 seconds, 1 minute, 5 minutes, and never sleep.

Shutdown: Shutdown time, adjustable options are 5 minutes, 10 minutes, 30 minutes, and never sleep.

温馨提示

➢ 初次使用前需阅读使用说明书，并按正确方法使用。

➢ 说明书阅读后请妥善保管，以便随时查阅、参考。

➢ 请勿损坏保修凭证和机身的保修封贴。

➢ 使用中遇到操作问题或仪器出现故障时，请与敞司联系，我们将为您提供热忱服务。

Warm Prompt

- ➢ **Read the instructions before the first use, and according to the correct way to use.**
- ➢ **Please look after your instruction after reading in order to look up, reference at any time.**
- ➢ **Do not damage the warranty certificate and the fuselage's warranty seal.**
- ➢ **Operation problems in the use of or equipment malfunction, please contact us, we will provide you with enthusiasm.**