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# **F-PLS User Manual**



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# **1** Brief Introduction

### 1.1 Overview

Power line security camera (F-PLS) is used to monitor the overhead power line (including transmission line and distribution line,tower and pole).F-PLS takes photo or short video periodically or manually,prevent the power line from damaging by people,vehicle or some other construction machines, such like theft the power line or equipment, wildfire, tower crane, excavator, especially in the construction site or the road which power line across.

F-PLS is a special camera which integrate with solar panel and battery inside. it also has 2G/3G/4 G communication, GPS positioning, 433MHz access, image recognition, line temperature measure ment, environmental monitoring, voice broadcast and other functions.

F-PLS is an important part of power line monitoring system. Adopting technologies of image acqu isition, data calculation, remote control, it provides an intelligent and visible real-time status monit oring solution for power line and power equipment.





### 1.2 Feature

#### 1.2.1 Industrial Application Design

- High performance 64 bit processor
- ♦ Stainless steel support
- ♦ IP67 protection
- "Solar energy + battery+ super capacitor" multi power source design

#### 1.2.2 Reliability

- Re-transmission mechanism, data not easy lost
- Photo priority and video assistant, high on-line rate and low communication failure
- Support 30 days continuous working without light
- 8 year life span
- ♦ 30000 hours MTBF

F-PLS-V1.0



- 2G/3G/4G antenna, GPS antenna, WIFI antenna, 433MHz antenna embedded
- ♦ SIM card embedded

#### 1.2.3 Easy to use

- Support National Grid online monitoring standard, National Grid encryption, Southern Grid online monitoring standard
- Compliant with transmission line photo/video specification standard
- Small size, light weight, compact structure
- Easy installation within 10 minutes
- Mounting bracket can be adjusted horizontally 360 degree and vertically 90 degree
- Support access to sound and light, temperature, meteorological module

### 1.2.4 Function

Itom	Content					
Item	F-PLS100	F-PLS110				
Timed photo	support					
Timed video	support					
Remote manual photo	SI	ipport				
Remote manual video	SI	ipport				
Real time video	Not support support					
Sound and light function	support					
Remote Shout Function	support					
Platform control function	support					
Zoom function	Not support	support				
Night shot function	Not support	support				
Intelligent analyse function	Not support	support				
Micro Meteorology access						
function	support					
Line temperature measuring						
access function	SI	ipport				
Auto & Manual working mode		mort				
function	SI	ipport				
Near field debug function	support					

Table1-Function



# **1.3 Specification**

#### **1.3.1 Basic Parameters**

Item	L	Content						
		F-PLS100	F-PLS110					
High definition 1		8 Mega pixel, max 2100 Mega	8 Mega pixel, max 2400 Mega pixel					
High definition is	ens	pixel optional	optional					
Low light lens		/	2 Mega pixel, min light 0.001Lux					
Zoom lens		/	20 times					
Down view lens		/	Support high definition, low light lens					
Tripod head		256 preset positions, 360	)° horizontally, 110° vertically					
Sound light Shout 200 m visible to light and hear sound								
ЪĊ	2 factors	wind direction, wind speed						
Micro	5 factors	wind direction, wind speed, air pressure, temperature, humidity						
Meteorology	6 factors	wind direction, wind speed, air pressure, temperature, humidity, rainfall						
Line temperature	temperature Range -40~+290 $^{\circ}$ C, accuracy ±1 $^{\circ}$ C, minimum start current 20A, Non-closed							
measurement		CT take power, cu	rrent capture each 1 min					
Adjusted angle		Horizon 36	0°, vertical 90°					
Power supply		Solar energy + Lithium iron p	hosphate battery + Super capacitor					
Solar panel		12W	40W					
Battery		Embedded 10Ah	Embedded 20Ah					
		10 pictures each day. Support 30	50 pictures each day, support 30 days					
Life time		days working without light	working without light. 1 hour video each					
Life time			day, support 30 days working without					
			light.					
Network Standar	ď	All netw	ork supported					
Life span		Abo	ve 8 years					

Table 2- Basic Parameters

#### **1.3.2** Physical Feature

Item	Content				
	F-PLS100	F-PLS110			
Weight	≤5kg	≤15kg			
Structure	Solar panel and main m	achine integrated design			
IP level	IP	67			

Table 3-Physical Feature

#### **1.3.3 Environment Parameter**



Item	Content						
Working	<b>25</b> ∼+70°C						
temperature	-25 -+70 C						
Storage temperature	-40~+85°C						
Relative Humidity	0~100%RH (No condensation)						
i i							

Table 4-Environment Parameter

# 2 Installation

#### 2.1 Overview

The equipment must be installed correctly to achieve the designed function, usually the equipment must be installed under the guidance of qualified engineers recognized by the company.

#### 2.2 Package List

For a safe transportation, the equipment usually needs a reasonable packing. Please take good care of the packaging materials when you unfold the box, so that it can be used in future transportation. The unpacking list is as follows:

Items	Details				
	F-PLS100	F-PLS110			
Camera and solar panel Integrated Device	1 Set	1 Set			
Pan-and-tilt camera Integrated Device	(Optional) 1set	(Optional) 1set			
Loud-speaker	(Optional) 1set	(Optional) 1set			
Micro-weather sensor	(Optional) 1set	(Optional) 1set			
Battery and solar panel integrated Device	(Optional) 1set	(Optional) 1set			
Wire temperature sensor	(Optional) 1set	(Optional) 1set			
Installation Instruction	1 Volume	1 Volume			
Warranty Card	1 Volume	1 Volume			
Certificate of Qualification	1 Volume	1 Volume			

Table 5- Equipment List

#### 2.3 Tower or Pole Installation

#### 2.3.1 Tool

- ➢ Adjustable spanner : 1 set
- Slot type screwdriver: 1 set

#### 2.3.2 Installation Angle and Height

- Camera direction: should be installed horizontal or downward, but not upward direction. Hidden area (such as construction site, accumulation, pond, fire, etc.) around the line/tower should be in the center of the image.
- Solar panel: solar panel should be installed at SBW 10°, without shelter, mainly toward the south.
- Installation height: Camera installed at the lowest point of the wire sag is with the best
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shooting Angle, as far as possible to install on high to prevent theft, try to apply the cross-brace installation.

#### 2.3.3 Installation Process







Pic:2-2

- Remove the package.then pull out the solar panel cable and fix it to panel side (hide it in panel backside and fix it by plugging it to the panel edge), Finally, lock the No.1 and No.2 screws.
- Turn on the power switch and observe and check the red light, if it is blinking normally, it means normal operation.
- Preset the direction of solar panel and camera according to the shooting area and suspension direction, and pre-install the device. Configure the WeChat account of on-site debugging person and input related equipment on the platform. Then find the line to be installed, and test the automatic take photo function.







- Hook the angle iron with two screw hooks and lock it with a screw head. As per photo 2-3.
- After adjusting the solar panel and camera angle, tighten screws No.1,2,3 and 4.as per photo 2-4.

#### Note:

Screw 1: adjust the horizontal angle of the solar panel

- Screw 2: adjust the levelness of the camera
- Screw 3: adjust the horizontal direction of the camera
- Screw 4: adjust the vertical direction of the camera



# **3** Platform Software

#### 3.1 Overview

The software and hardware of the platform shall be used together. After the installation of the equipment, users can check the position, pictures, video, sensor data and other information on the platform. Users shall ask for the account number and password from the service staff before logging into the platform initially.

#### 3.2 Add New Equipment

Step 1: Add power lines and tower poles (after adding tower pole, remember to add "monitor point" information).



Pic 3-1

*	首页	〔 监拍规则管理 × 4	路信息管理 ×						
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4		国网邯郸供电公司	大魏线	12000			MILOI		
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6		国网邯郸供电公司	辛魏Ⅰ线	备注					
7		国网邯郸供电公司	辛曲  线						
8		国网邯郸供电公司	辛双线						保存 ×取消
9		国网邯郸供电公司	贺留线						



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2		国网邯郸供电公司	辛目耳线	#46		1	220	直线型	运行中					+监拍点	+测温点	+关联用/
3		国网邯郸供电公司	来溢线	监护	点	-										× HF
Ļ		国网邯郸供电公	辛魏Ⅰ线		<b>+</b> 新		ノ修改		* #154							(用)
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0		国网邯郸供电公司	贺留线	-										4	+	(EFFE)

Pic 3-3

Step 2: Add SIM card and camera information (after that, it must be installed on the tower, and the installation of temperature measurement module and weather module is with the same steps.)



Pic 3-4

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			单位	单位:	厦门四信智慧电	力科技有限公司	~
1		厦门四信智慧电力科技	支有限公司	电话号码:			
2		厦门四信智慧电力科技	支有限公司	质保年数:	1		~
3		厦门四信智慧电力科	支有限公司	网络类型:			~
				状态:	已启用		~
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图 3-5



				- ×	批量拆除	
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7 Ng: 王ap	装置类型:	主机	~	功能属性:		~
□ 操作 	镜头类型:	普通镜头	~	厂商:	信通电子	~
	15' 装置型号:	ST2303B/S V2.0	~	版本号:		
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	质保年数:	1	~ >			
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图 3-6

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图 3-7

Step 3: Correlate the devices to the group and user as required



Pic 3-8

#### **F-PLS User Manual**



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	所属部门		用户名称	登录帐号	手机号	操作
1	国网邯郸供申	电公司	李辉	18931033229	18931033229	☞关联GT
2	国网邯郸供国	自公司	房延杰	18531008766	18531008766	☑关联GT
3	国网邯郸供申	电公司	范学军	13931057269	13931057269	₿关联GT
4	国网邯郸供申	电公司	杨磊	18630059800	18630059800	☑关联GT
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4.4	PIC2#7#7/14-1	ьл <b>э</b>	±7+73	45475050473	45475050472	T24EACT





Pic 3-10

### **3.3 Real-time Monitoring**

After adding the device, the data information of the device can be viewed in the real-time monitoring.

Click "real-time monitoring" and select the device to view to see all pictures of the device, click any picture to enter the large picture display and operation page, then historical pictures, temperature data, weather data will be indicated in the picture.and it also can auto-take photos, take auto-record video, view location information, set group and hidden danger types, etc..



Pic 3-12

# **3.4Photo Rotation**

Picture rotation can replace manual view of equipment pictures. Set rotation conditions after entering this page, and then start rotation.







#### Pic 3-13

# **3.5Warning Process**

The platform analyzes the pictures and video data reported by the monitoring and photographing device in real time, and displays the hidden trouble pictures in the first time when hidden trouble occurs near the corridor of the line. Users can also conduct corresponding operation for the hidden trouble.

	· 野松盛餅O 页首					在运98 在线。(	52 南线: 36
预	警信息列表					預費間片	
	預誓时间▼	XL	GT	监拍朝向	单位		
1	2018-10-08 09:15:10	lzp_2600	#882	大号侧	国网山东省电力公司	2018-10-25 16:19:22	
2	2018-10-08 09:05:11	lzp_2600	#B82	大号侧	国网山东省电力公司		
3	2018-10-08 08:55:09	lzp_2600	#882	大号侧	国网山东省电力公司		
4	2018-10-08 08:25:12	lzp_2600	#882	大号侧	国网山东省电力公司		
5	2018-10-08 08:17:59	lzp_2600	#887	大号侧	国网山东省电力公司		
6	2018-10-08 08:15:16	lzp_2600	#B82	大号侧	国网山东省电力公司		
7	2018-10-08 08:04:53	V4.0_新版	B16#	大号侧	国网山东省电力公司		and a
8	2018-10-08 07:05:11	lzp_2600	#B82	大号侧	国网山东省电力公司	and the second s	
9	2018-10-08 06:25:09	lzp_2600	#882	大号侧	国网山东省电力公司		and a
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12	2018-10-08 03:05:20	lzp_2600	#B82	大号侧	国网山东省电力公司		
13	2018-10-08 00:37:59	主辅机跟踪	15	大号侧	国网山东省电力公司		
14	2018-10-07 22:05:19	lzp_2600	#B82	大号侧	国网山东省电力公司	The second second second	UP
15	2018-10-07 21:35:11	V4.0_新版	B16#	大号侧	国网山东省电力公司		
16	2018-10-07 21:25:18	lzp_2600	#B82	大号侧	国网山东省电力公司	10kV惠安惠安线1号杆塔大号倾	川杆塔
17	2018-10-07 20:35:17	lzp_2600	#B82	大号侧	国网山东省电力公司		
18	2018-10-07 20:25:18	lzp_2600	#B82	大号侧	国网山东省电力公司		

Pic 3-14

### **3.6Alarm Process**

The platform analyzes the pictures and video data reported by the monitoring and photographing device in real time, and displays the hidden trouble pictures in the first time when hidden trouble occurs near the corridor of the line. Users can also conduct corresponding operation for the hidden trouble.



Pic 3-15



# **3.7Configuration Policy**

The platform can set the rules of taking photos, temperature alarm, micro weather alarm, etc. Since the device is in a dormant state when it is not in working status, it takes a certain time to take effect after parameter setting.



图 3-16



Pic 3-17

632 ×					
×删除 O	查询				
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Pic 3-18

# **3.8Statistics**

The platform carries out automatic statistics on warning and alarm, operation status and device information, and the corresponding statistical information can be viewed through the statistics interface.

↓ ● 告警处理 策略	6 20 20 20 20 20 20 20 20 20 20 20 20 20	
预警告警	运行情况	监测装置
图片预警查询	实时接入统计	图片查询
预、告警处理统计	有效接入统计	视频查询
温度告警统计	装置完好统计	温度查询
告警原因统计	每日拍照查询	微气象查询
	历史拍照查询	监拍装置统计
	商线装置统计	装置厂商统计

Pic 3-19

		F-PLS User Manual
مربع مربع		
*音页 预, 告望处理统计 × 今日預警处理	本周预警处理	在远:1套 在线:1套 高线:0套 本月预警处理
÷ 22	A B <sup>2</sup>	· 음말 관등:68948
今日告警处理	本周告警处理	本月告警处理
数据没有内容	数据没有内容	数据没有内容

Pic 3-20

# 3.9System Management

The platform supports the management of gourps, roles, users, and organizational parameters (not all users have this capability, depending on the level of the account).













Pic 3-23

所	萬組织: 🚺	门四信智慧	电力科技有限公 🖌 用户	名称:		登录账号:	手机:
		1	田山文称		25,774.821.52		
1	□ 庄洋	新増				×	厦门四信智慧电力科技
2	□ 庄作	用户名称:		登录账号:			厦门四信智慧电力科技
3	□ 林会	用户密码:	•	确认密码:		•	厦门四信智慧电力科技
4	回际	出生日期:		性别:	○男 ○女		厦门四信智慧电力科技
5	□ 蒋排	手机:		电话:			厦门四倍智慧电力科技
6	□ 7 <sup>00</sup> 5	QQ号:		是否关联微信	: ●关联 〇不	关联	厦门四信智慧电力科技
7	二 江洋	eMail:		账号状态:	启用	~	厦门四信智慧电力科技
8	🗌 adr	新属组织	厦门四信恕替由力科技有	個公司			厦门四倍智慧电力科技
9	[] 测试	#-Q.		174.24 HS			厦门四信智慧电力科技
		<b>用已</b> .					
		TUERBRE:				=	
		家庭地址:				$\exists$	
		备注:					
						_	
					✔保存	×取消	

Pic 3-24

# **4** Wechat Function

Real-time Photo Delivery: every photo taken by the device is immediately delivered to the user, which can be turned on or off in the Settings.



Deliver Alarm: the platform automatically identifies hidden dangers and deliver them to users.



Power Line Circuit inspection: automatic inspection on the latest photos of all equipment.





Pic 4-4

Take photo and record video actively, historical data and acousto-lighting control: the device can be remotely controlled and the historical data can be checked through this function



Pic 4-5