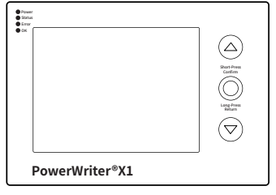
多功能调试烧录器说明书

（型号：PWX1）



软件下载　在线文档　FAQ

powerwriter.com | icworkshop.com

创芯工坊科技（深圳）有限公司

感谢您购买此产品，为了让您更充分的了解产品特性和操作方法，我们建议您在使用之前先阅读本手册。

1、重要提示（必读）

- 请使用随机配备的配件，Type-C USB 线缆、信号线材以及其他配件，避免通信不稳定造成无法正常与设备或者与目标芯片进行通讯。
- 应尽量避免使用Hub，选择直连PC USB端口将提高通信的稳定性。
- 在驱动功率较大的PCB板卡时，请使用随机配备的DC 电源进行供电，避免USB供电不足造成系统工作不稳定。
- 设备通讯端口带隔离保护功能，但应用在特殊（高压）场景下，仍需要配备PowerWriter®高压隔离驱动控制器来进行隔离，详询客服或技术支持。
- 当系统 ≥ Windows 7 SP1 时，设备为免驱（无需额外安装驱动），通过系统原生驱动即可驱动设备，如设备通讯异常，请通过PowerWriter®客户端->菜单->帮助->设备驱动安装进行驱动的安装、卸载、清理重装等操作，如需帮助，请联系技术支持。

2、包装清单（标配）

名称	数量	单位
收纳包	1	个
PowerWriter® X1 主机	1	台
DC 电源适配器 (12V/2A)	1	个
Type-C USB 数据线（带屏蔽）	1	条
2.54mm/24AWG/20mm 4 pin 定制硅胶线	2	条
2.54mm/24AWG/20mm 5 pin 定制硅胶线	2	条
2.54mm/24AWG/20mm 6 pin 定制硅胶线	1	条
2.54mm 20 pin JTAG 线	1	条
2.54mm 5 pin烧录探针	1	个
接口信号转接板	1	个
防滑脚垫	8	个
说明书	1	张

（*注：支持选配ICWKEY：高阶加密授权签名；USB无线适配器：支持蓝牙连接，详询客服。）

3、基本参数

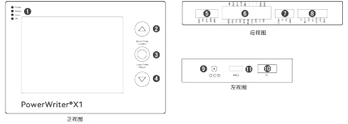
主机尺寸 主机重量（不含配件）	（长宽高）107mm * 75mm * 17mm(≈) ≈145g
显示接口	3.2 英寸/320 * 240 (RGB565)
操作模式	左上/右下导航，短按确认，长按返回
电源输入	USB Type C :5.0V±0.2V / 500mA DC :9~24V(耐压)/ 3A (3.5mm)
电源输出	VIN :3.3V ~5.5V / 3A VREF :1.8V~5.0V (±0.1V) / 700mA 3.3V :700mA (±0.1V) 5.0V :1A (±0.1V)
波形输出	1Hz ~120Mhz（电压可调）(*)
LED指示	VREF 电源输出/状态/错误/成功
USB 接口 (主机)	USB 2.0 (Type -A 输出5.0V/500mA)
USB 接口 (从机)	USB 2.0 (Type -C 支持正反插)
信号接口	2.54mm (2 * 5 pin, 1 * 4 pin, 20 pin 标准牛角座)
工作温度	-20℃~+60℃

4、功能参数

通信时钟	最高20Mhz（可调）(*)
接口协议	SWD / JTAG/SWIM / SPI / I2C / UART（支持代理）/自定义 (*)
在线功能	全功能在线、自动化编程（自启停）、工厂模式
离线功能(脱机)	机台、多镜像、U盘模式，断点恢复等
安全与签名	内置签名、ICWKEY授权密钥、设备锁等
调试器	ARM® Cortex-M (Win-USB、HID)
平台(App)支持	创芯工坊平台、微信小程序（**需配无线适配器**）
扩展	AT接口、USB Host 扩展 (*)
其他	日志、主题、显示翻转、多语言、屏保、显示格式、亮度调节等

（*注：部分特性在设备更新维护过程中可能会进行调整，以更新为准，恕不另行通知）

5、外观与接口定义



视图 / 编号		功能	介绍	
前视图	❶	状态灯	Power	VREF 电源输出指示
			Status	常亮：目标芯片连接、闪烁：忙
			Error	操作失败
			OK	操作成功
	❷	左/上	往左，往上导航	
	❸	确认/返回	短按确认、长按返回上一级菜单	
	❹	右/下	往右、往下导航	
后视图	❺	SWD	GND	电源GND
			RST	目标芯片复位引脚
			CLK	SWD时钟（JTAG时钟）
			DIO	SWD数据（JTAG测试模式选择）
			VREF	目标芯片参考电压(输入/输出)
	❻	组合信号	TDO	JTAG 数据输出
			SWIM	STM8 信号
			TDI	JTAG 数据输入
			TRST	JTAG 复位
			PWM(CLR)	波形输出(1Hz~120Mhz)
			BOT0	BOOT0 控制引脚
			3.3V	独立3.3V电源输出 (700mA)
			5.0V	独立5.0V电源输出 (700mA)
			VIN	系统电源输入 (3.3V~5.5V)
	❼	串口	RX	串口接收
			TX	串口发送
	❽	机台	EOT	设备EOT信号输出 (低)
			BUSY	设备BUSY信号输出 (高)
			OK	设备OK信号输出 (高)
			NG	设备Error信号输出 (高)
			CTRL	设备启动信号 (低脉冲)
左视图	❾	DC	3.5mm DC电源，支持9~24V/3A输入	
	❿	从机USB	设备通信，ICWKEY连接	
	⓫	主机USB	USB无线适配器、闪存盘等	

（*注：EXT1~3用于功能扩展保留引脚，上述表格重复引脚仅标注一次，不同的硬件版本（丝印）可能存在调整，恕不另行通知，组合信号端口建议使用信号转接板。）

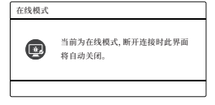
6、快速入门

6.1 准备

- 下载**PowerWriter® For ARM**客户端软件并安装，安装完成后将在桌面上出现**PowerWriter®**的快捷方式，双击启动，扫描首页二维码/**软件下载**或访问：https://www.powerwriter.com/index/index/products?p=2&c=files 。
- 使用随机配备的Type-C USB线连接**PWX1**主机与PC的**USB端口**，等待启动完成。
- PowerWriter® 客户端默认自动识别并连接PWX1主机，如果设备连接成功，则将会在日志栏看到**设备信息**，如下所示：

```
04/05-15:00:08:655> 检测到驱动已经安装....
04/05-15:00:09:251> Writer Info: hwVer:x.x blVer:x.xx.xx ifVer:x.xx.xx
SN:xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx Target:PWX1
04/05-15:00:09:267> PowerWriter® 已连接...
04/05-15:00:09:283> 版本切换:PWX1
04/05-15:00:09:973> Resource version:1.x.x size:0xxxx  crc32:0xxxxxxx
04/05-15:00:09:988> 同步设备时间成功...
04/05-15:00:10:019> 更新烧录器设置完成...
```

- 此外**PWX1** 主机显示设备在线提示框，如下所示：



- 点击PowerWriter®**客户端软件->烧录器设置->MCU型号**，根据弹出的窗口选择需要操作的目标芯片（**可使用搜索功能**），点击确定按钮。
- 参考**外观与端口定义**连接芯片与X1设备，如连接成功，将在PowerWriter®客户端日志栏以及底部状态栏看到目标芯片已连接的提示，如下所示：
04/05-16:05:32:394> **目标芯片 已连接**

（*注：如无法连接设备，请尝试更换USB端口或通过PowerWriter®客户端菜单：帮助->驱动安装->安装最新驱动后重试，无法连接目标芯片时请检查通信端口接线，如仍无法解决，请联系客服或技术支持。）

6.2 在线编程

- 切换PowerWriter®页面到Program Memory（或Main Flash）页面，点击**添加固件**按钮导入需要烧录的固件，然后点击确定按钮（**如提示多段固件可合并添加**）。
- 点击工具栏的**自动（机器人图标）**按钮，PowerWriter®将自动完成数据的烧录和校验，并将信息显示在**日志栏**中，如下所示：

```
04/05-16:16:50:451> PowerWriter®全功能在线编程...
04/05-16:16:50:469> 写入出厂默认选项字节...
04/05-16:16:51:301> 重新计算Program Memory 数据...
04/05-16:16:51:331> 智能在线擦除芯片...
04/05-16:16:51:408> 写入芯片数据
04/05-16:16:52:157> 写入用户自定义选项字节...
04/05-16:16:53:108> 全部完成！
```

6.3 离线编程

- 点击PowerWriter®菜单：**执行->离线加载**（根据提示选择保存项目）。
- 加载完成后，点击**烧录器设置->通讯配置->断开连接**，断开设备在线连接。
- 切换PWX1 界面到**脱机烧录按钮**，移动焦点到 ▶点击启动烧录，烧录结束后，界面将显示操作结果。

6.4 更多功能

PowerWriter® X1 支持完整的**在线编程、离线编程、工厂模式编程、机台烧录，二次开发集成、连接创芯工坊云平台、微信蓝牙小程序、集成调试器**等丰富的功能特性，更多操作教程请扫描首页二维码或访问：https://docs.powerwriter.com。

7、保修条款（仅适用于中国大陆地区）

- 产品自售出之日起7天无理由退换货（不影响二次销售、人为损坏除外）。
- 1个月内非人员损坏只换不修（包邮）。
- 提供1年的质保。
- 超过1年但修，需承担维修人工和材料费，以及邮费。

对于以下情形，不提供免费保修服务：

- 一切人为损坏、私自改装、维修造成设备损坏的。
- 超出设备工作环境要求造成设备损坏的。

（*注：服务条款如有变更，请关注更新服务条款信息，恕不另行通知。）

8、附录

- 服务电话：(+86) 400-1568-598 或 (+86) 0755-83831322
- 服务邮箱：cs@icworkshop.com
- 技术支持：(+86) 136 3278 4295

（周一~周五：上午9:00-12:00、下午1:30~7:00）

PowerWriter天猫旗舰店　创芯工坊淘宝店　PowerWriter京东自营店

微信公众号　微信交流群　技术支持QQ群　商务合作

⚠ 警告

此产品含有纽扣电池

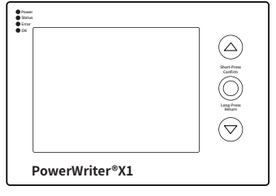
如果吞下，锂纽扣电池可能在两小时内造成严重或致命的伤害。

请将电池远离儿童。

如果你认为电池可能已被吞下或放置在身体的任何部位，请立即寻求医疗帮助。

PowerWriter®Debugger& Gang Programmer

（Model：PWX1）



PC Software　Online Guideline　FAQ

powerwriter.com | icworkshop.com

ICWORKSHOP Technology (Shenzhen) Co., Ltd.

Thank you for purchasing PowerWriter X1, in order to fully understand the product, we strongly recommend that you read this manual before using!

1.Important Note

- Please use original accessories, such as Type-C USB cables, signal cables etc. to avoid failure to communicate with the device or the target chip.
- Connecting PC USB port instead of Hub to improve communication stability.
- When the current load of the PCB board is large, use **DC power** supply to improve power stability.
- Device communication port with isolation protection. However, for special (high voltage) applications, PowerWriter® High-Voltage Isolated Module is required for isolation. For details, please contact us.
- As system version ≥ Windows7 SP1, driver installation is optional. If communication fails, clear previous driver and re-install the drivers from: **Menu->Help->Driver Installation**. For help, contact technical support.

2.Packing List (Default)

Description	Quantity	Unit
Storage bag	1	pc
PowerWriter® X1 device	1	pc
DC power adapter (12V/2A)	1	pc
Type-C USB cable (shielded)	1	pc
2.54mm/24AWG/20mm 4 pin silicone wire	2	pcs
2.54mm/24AWG/20mm 5 pin silicone wire	2	pcs
2.54mm/24AWG/20mm 6 pin silicone wire	1	pc
2.54mm 20 pin JTAG cable	1	pc
2.54mm 5 pin programming probe	1	pc
Interface signal switching board	1	pc
Non-slip pads	8	pcs
User manual	1	page

(*Note: Support optional ICWKEY: for high-level encryption authorization signature; USB-wireless adapter: for BLE connection, contact us for details.)

3. Basic

Size	(LWH) 107mm * 75mm * 17mm(≈)
Weight (device)	≈145g
Display	3.2 inch /320 * 240 (RGB565)
Operation	Left/Up & Right/Down for navigation Confirm(short press), Return(long press)
Power Supply	USB Type C :5.0V±0.2V / 500mA DC:**9~24V (withstand voltage) / 3A (3.5mm)**

Power Supply	VIN :3.3V ~5.5V / 3A
Power Output	VREF :1.8V~5.0V (±0.1V) / 700mA
	3.3V :700mA (±0.1V)
	5.0V :1A (±0.1V)
Output Wave	1Hz ~120Mhz (adjustable voltage)(*)
LED Indicate	VREF Power/Status/Error/OK
USB (Host)	USB 2.0 (Type-A 5.0V/500mA)
USB (Device)	USB 2.0 (Type-C, supports FWD & REV)
Signal Interface	2.54mm (2 * 5 pin,1 * 4 pin,20 pin)
Working Temp.	-20℃~+60℃

4. Functional Parameter

Clock	Max. 20Mhz (adjustable)(*)
Protocol	SWD / JTAG/SWIM / SPI / I2C / UART (agent) / User-Defined (*)
Online	Full automation, Automatic Programming, Factory mode
Offline	Full automation, U-disk, Mirror programming, etc.
Security & Auth.	Matrix, ICWKEY license, Device lock
Debugger	ARM® Cortex-M (Win-USB、HID)
App (Cloud)	ICW Cloud, WeChat Applet (*Wireless adapter required)
Extension	AT interface, USB Host(*)
Others	Log saving & exporting, Theme switching, CN/EN switching etc.

(*Note: Feature adjustment during update and maintenance without prior notice.)

5. Appearance and interface

View / No		Feature	Description	
Front	❶	Status LED	Power	VREF indication
			Status	On: Connected; Blinking: Busy
			Error	Operation failure
			OK	Operation success
	❷	L/U	Left/Up navigate	
	❸	Conf./Rtn.	Short press: Confirm; Long press: Return	
	❹	R/D	Right/Down navigate	
Rear	❺	SWD	GND	Power ground
			RST	Target reset pin
			CLK	SWD clock (JTAG TCK)
			DIO	SWD data (JTAG TMS)
			VREF	IO VREF (Input/Output)
	❻	Composite IO	TDO	JTAG TDO
			SWIM	STM8 IO
			TDI	JTAG TDI
			TRST	JTAG TRST
			PWM	Wave out (1Hz~120Mhz)
			BOT0	BOOT0 control
			3.3V	Independent 3.3V (700mA)
			5.0V	Independent 5.0V (700mA)
			VIN	System power (3.3V~5.5V)
	❼	UART	RX	UART RX
			TX	UART TX
	❽	Programming Machine	EOT	EOT signal output (Low)
			BUSY	BUSY signal output (High)
			OK	OK signal output (High)
			NG	NG signal output (High)
			CTRL	Start (Set low then release)
Left	❾	DC	3.5mm DC,**9~24V/3A** supported	
	❿	USB Device	Communication port/ICWKEY	
	⓫	USB Host	USB wireless adapter, flash disk etc.	

(*Note: EXT1~3 are reserved for function expansion. Duplicate pins are marked only once. Different HW version may be adjusted without notice. Signal adapter plates are recommended for combination signal ports.)

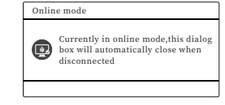
6. Quick Start

6.1 Prepare

- Visit "https://www.powerwriter.com/index/index/products?p=26&c=files" to download **PowerWriter For ARM** software & install, launch desktop shortcut named **PowerWriter®**.
- Use original Type-C USB cable to connect PowerWriter X1 to PC USB port and wait for the startup to complete.
- Desktop software identifies and connects to the **X1** device. If successfully connected, device information will be displayed in the logger, as follows:

```
04/05-15:00:08:655> The driver has been installed....
04/05-15:00:09:251> Writer Info:  hwVer:x.x blVer:x.xx.xx ifVer:x.xx.xx
SN:xxxxxxxxxxxxxxxxxxxxxxxxxxxx Target:PWX1
04/05-15:00:09:267> PowerWriter® Connected...
04/05-15:00:09:283> Version switching:PWX1
04/05-15:00:09:973> Resource version:1.x.x size:0xxxx crc32:0xxxxxxx
04/05-15:00:09:988> Synchronizing device time succeeded...
04/05-15:00:10:019> Apply settings complete...
```

- In addition, the PWX1 displays the device online prompt box, as follows:



- Click PowerWriter®-> **Writer Setting** -> **Select**. Select target MCU part no., that click **OK**.
- Refer to interface definition to connect target chip with PWX1 device properly. If connection is successful, you will see in the logger & status bar indicate target chip is connected, as below: 04/05-16:05:32:394> **Target chip connected**

(*Note: If the device connect failed, try to change USB port or refer to menu: Help -> Driver installation -> install the latest driver and try again. If the target chip connect failed, check the communication interface. For further help, please contact us.)

6.2 Online programming

- Switch tab to **Program Memory** (Main Flash)page. Click Add Firmware button to import the target firmware.
- Click the **Auto** (robot icon) button in toolbar and will automatically complete the programming and verification, logging as follows:

```
04/05-16:16:50:451> PowerWriter® full online programming...
04/05-16:16:50:469> Programming vendor default option bytes...
04/05-16:16:51:301> Recalculate the Program Memory data...
04/05-16:16:51:331> Intelligent online erase chip...
04/05-16:16:51:408> Programmed chip data
04/05-16:16:52:157> Programming custom option bytes...
04/05-16:16:53:108> All done!
```

6.3 Offline programming

- Click menu: Operation->Offline load (Follow the prompts to select save project).
- After loaded, click **Disconnect** button to disconnect the device.
- Switch to PWX1,move to ▶button and click to start programming. After programmed, the interface will display the operation result.

6.4 More

PowerWriter® X1 supports online & offline programming, automatic machine, AT-command, ICWORKSHOP.com cloud service, WeChat applet and integrated debugging etc. For more features, please visit: http://docs.powerwriter.com.

7.Warranty (Only available in Mainland China)

- Return and exchange within 7 days. (**Does not affect secondary sales**).
- Within 1 month only replacement without repair (free shipping).
- 1 year warranty.
- > 1 year, charged service and parts for repairs.

The following circumstances do not apply to the free warranty service：

- All artificial damage, private modifications and repairs that cause damage to the equipment.
- Damage to equipment caused by exceeding the requirements of the operating environment.

(*Note: Terms of Service are subject to change without prior notice.)

8.Appendix

Tel：(+86) 400-1568-598 or (+86) 0755-83831322

Email: cs@icworkshop.com

Technical support: (+86) 136 3278 4295

(Mon. ~ Fri., AM 9:00-12:00, PM 1:30-7:00)

Tmall　360 Buy　AliExpress

WeChat Public　WeChat Group　QQ Group　Business Contact

⚠ WARNING

THIS PRODUCT CONTAINS A BUTTON BATTERY

If swallowed, a lithium button battery can cause severe or fatal injuries within 2hours.
Keep batteries out of reach of children.
If you think batteries may have been swallowed or placed inside any part of the body, seek immediate medical attention.