# 3.3.6: 如何运行时监控变量

当前PowerWriter 暂未提供类似 **JScope** 这类监控软件,如需要监控目标芯片的运行时实时变量数据,可以借助第三方或者芯片厂家提供的监控工具,例如:

恩智浦(NXP) 提供的 FreeMASTER 就是一个不错的选择, FreeMASTER 的下载地址为如下:

- FreeMASTER Run-Time Debugging Tool | NXP Semiconductors
- 百度网盘备份下载

♀ 提示

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# 1: FreeMaster简易入门

### 1.1: 项目设置

Project -> Options 打开项目设置

Project - FreeMASTER		
File Edit View Explorer	Project Tools Help	
: 🚅 📕 🚳 💷 🗝 🖪 🖻	Variables	👷 🕫 😥 👕 🛨 🛧 💕 😭 😢 🕴 Tahoma 🕞 8
Project Tree	Enumerations	
🖾 New Project	Commands	
	Reload Symbol File Ctrl+M	bme to FreeMASTER
	Select Symbol File	
	Resource Files	
	Options Ctrl+T	0. Click Options
	Project	re i <del>mormatio</del> n

在Comm(通讯) Tab 页,选择 Plug-in module 为 **FreeMASTER CMSIS-DAP Communication Plug-in**,如下图所示:

Velcome		×	
at more in	Comm MAP Files Pack Dir HTML Pages Demo Mode Views & Bars	1	
	O RS232: Port: COM1		
( What	Image: Plug-in module       FreeMASTER CMSIS-DAP Communication Plug-in         Connect string: <ul> <li>Configure</li> <li>Save settings to project file</li> <li>Save settings to registry, use it as default.</li> </ul>	R	Fre
Read mor	Communication state on startup and on project load Open port at startup O not open port at startup	s and	Sh
vyect vWatch Name	<ul> <li>○ Store port state on exit, apply it on startup</li> <li>□ Store port state to project file when saving, apply upon its load</li> <li>Advanced</li> </ul>		Comment
	确定         取消         应用(A)		

在Map Files Tab 页面,按照如图流程,选择 MDK 或者 IAR, GCC 编译出来的: axf, elf, map 等格式文件。

	Project - Heelwinartin			
	Options	× ∎ 打开		×
	Comm MAP Files Pack Dir   HTML Pages   Demo Mode   Views & Bars	$\leftrightarrow \rightarrow \checkmark \uparrow$ $\stackrel{\frown}{=} $ « var_watch_check $\rightarrow$ 1	MDK-ARM > var_watch_check	C C 在 var_watch_check 中腹素
•	Default symbol	import file <sup>追识</sup> 新建文件夹		
	File format:		名称	
	List of all valid symbol files:	> 🖹 文档	var_watch_check.axf	2022-10-28 15:48  AXF 文件
	View	> 业 下载	var_watch_check.map	2022-10-28 15:48 Linker Address .
	Note: The file selected in the list will be used as default symbol	> 📀 音乐		
	file when the project is opened	> 🧾 桌面		
?	Let the user select initial symbol file when project loads	> ៉ System (C:)		
	✓ Prompt to reload symbols when symbol file changes and show missing symbols	> 👝 ToolKit (D:)		
	Always     C Except after initial project load	> 👝 Projects (E:)		
		> 🛋 Mobile HDD (F:)		
	确定 取満 应用(A)	🚽 🗸 🚍 Mobile HDD (F:)		
	New Project	> 🦰 2018python		
:	Name Value	> 🦲 2018web		elf, abs, map, out, axf file
?	-	UNCHARTED_Legacy_of_Thieves_Collectic		
		文件名(N):		Executable and symbolic file $\vee$
				Executable and symbolic files (*.elf; *.abs; *.map; *.out; *.axt) ELF executable files (*.elf)
		the second se		ABS executable files (*.abs) MAP files (*.map)
	Application Commands Nariable Stimulus			OUT executable (*.out) AFX executable (*.axf)
	Ready	Not connected		All files (*.*)

导入文件后,选择正确的文件解析格式,

2	Comm MAP Files	Pack Dir HTML Pages Demo Mode Views & Bars	1
? (	Default symbol	C:\Users\CSHSOFT\Desktop\debug\var_watch_check\MDK-A	
	File format:	✓ Edit Del	ΡN
	List of all valid symbol files:	Binary ELF with DWARF2/DWARF4 dbg format. Hiware MAP File509; SmartLinker v5.0.9 >> Define new regular expression-based parser	
		● Select file format <sub>View</sub>	
		Note: The file selected in the list will be used as default symbol file when the project is opened	

#### **▲** 特别提示

选择文件需要选择带符号信号的 文件,比如axf,elf,map等格式文件,目的是获取 需要监控的符号名,格式,地址等信息,不能导入bin,hex等文件,选设置完成后,可以通过点击 View 查看符号信息,如果正常解析,则说明设置正确。

#### 1.2: 添加监控变量

可快速在Variable Watch 窗口右键点击 **Create New Watched Var...** 来创建变量监控,如下图 所示:

amands → Q X	4	W Ve Read	hat's New in ersion 3.2.0? more about new	/	Con in Ge	munication Drivers MCUXpresso SDK et the FreeMASTER		Visit FreeMASTER home page	FreeMASTER community forum Share your experience or	
	New Project									
	Variable Wat	ch ame	Value		Unit	Period [ms]			Comment	
						Edit variable <u>Watch Properties</u> <u>R</u> eset MIN/MAX Reset MIN/MAX to All Var:				
Commands 🔊 Variable Stimulus						<u>Create New Watched Var</u> Clo <u>ne To New Watched Va</u> Re <u>m</u> ove From Watch	r	] 0		
						Create New Oscilloscope Create New Recorder				

设置监控属性

		in a manage of the second seco					
	Variable	powerwriter_var	Sam <u>p</u> ling	1 s	✓ Sho <u>w</u> as: DEC	•	
iet m	Variable -	[0x20000000] 1	Bit fields		Show		
	<u>A</u> ddress:	powerwriter_var	When the value	is received,	l vai   min	ma <u>x</u>	
	<u>T</u> ype:	_Vectors_End 1 _Vectors_Size	选择需要监持	的变量			
	Format:	0x0000 AHBPrescTable AHBPrescTable(0)					
	Real type	BuildAttributes BuildAttributes\$\$THM_ISAv4\$P\$D\$K\$	\$B\$S\$PE\$A:L22UL4	41UL21\$X:L11\$	S22US41US21\$IEEE1\$I	W\$USESV6\$	~STKCKD\$USESV7
Project ble Watch Name	☐ Use 'M ☑ Reset H <u>H</u> istory	powerwriter_var Region Region\$\$Table\$\$Base Region\$\$Table\$\$Limit Stack_Mem SystemCoreClock uwTick uwTick uwTickFreq uwTickPrio					
				确定	取消	並用(A)	

#### 按照需求更改其他设置

10	Definition Modifying Comments	1、采样频率 2 显示模式
n	Variable powerwriter_var Variable [0x20000000] 1 Address: powerwriter_var • Type: unsigned int • Size: 4 • Format: Fixed point number •	Sampling       fastest       ✓       Show as:       HEX       ✓         Bit fields       ✓       Show       ✓       ✓       Show         When the value is received,       ✓       yal       min       max         shift it:       ○       bits right,       fixed digits:       ÷         mask with:       no       mask (-1)       ✓       Fill left zeroes
h me	Real type transformation          None       ✓       Unit: unit         □       Use 'Moving Averages' filter         ✓       Reset history on manual modify         History       5000       ms	Text enumeration (after transform)  Enumeration enabled Always show numeric value  default: unknown  Show number

完成后,确定。

## 1.2: 启动

将PowerWriter 与目标芯片与目标芯片正确连接,点击工具栏的 Go 按钮,启动监控,如下图所示。



即可看到变量的实时变化值,如下所示:

Project Tree	▼ # × V	/ariable Watch				
[19] New Project	-	Name powerwriter_var	Value 0x33baf95	Unit	Period [ms] 0	

**是匹配的**, 否则将导致错误的监控结果。

## 2: 补充

FreeMASTER 的详细使用教程,请参考官方文档,以及其他相关信息。



