



BF7264 系列
MIPI M-PHY UFS2.1
方案说明

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概况

支援型号:

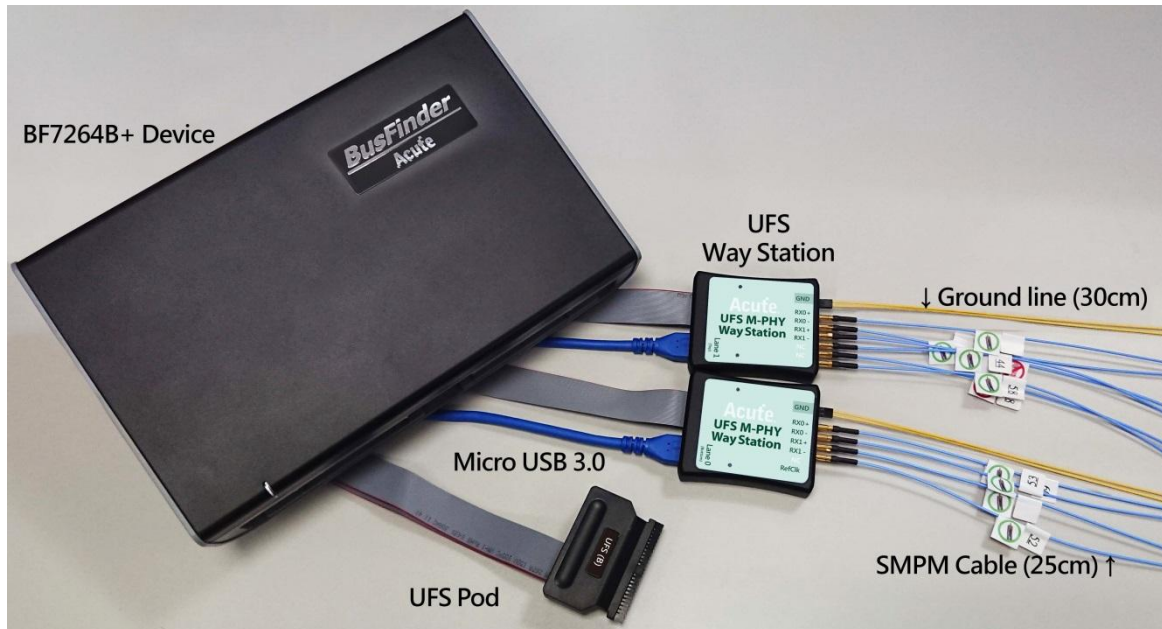
BF6264B	BF7264B	BF7264B+	BF7264 Pro
		●	●

BF7264B+/Pro 产品正面有两个 USB 孔

此方案仅于 BF7264B+/Pro 产品提供 MIPI M-PHY UFS2.1 分析仪功能(可解析 UFS3.1 命令组)。

MIPI M-PHY UFS2.1 方案，规格内容如下：

1. BF7264B+/Pro，32Gb RAM，搭配 MIPI M-PHY UFS2.1 探头组



2. 完整支持 MIPI M-PHY UFS2.1 以及支持 UFS3.1 命令组

MIPI M-PHY 3.0, Up to 5.8Gbps (Gear 3, Rate A / B), 2 Lanes

MIPI Unipro 1.8

JEDEC UFS 2.1

JEDEC UFS 3.1 commands



3. 可同时显示 Unipro 及 UFS 协议封包数据以表格方式呈现，包含指令解析

Transaction (Unit: Bus/Bus/Unit)	Host	Device	Seq. No.	Transaction (Unit: Bus/Bus/Unit)	Host	Device	Seq. No.
11:29:31.596.787.079 170.1	Start of Burst			237	2.824.603.474 803.56us	QREQ (READ FLAG)	
11:29:31.596.787.086 6.66ns	Filler(2x)			238	2.824.803.614 200.13us	QRESP (READ FLAG) (Su...	
11:29:31.596.792.809 5.72us	AFC TCO CReq=0	06		239	2.825.410.440 806.82us	QREQ (READ FLAG)	
11:29:31.596.798.598 5.78us	Filler(2x)			240	2.825.816.500 206.05us	QRESP (READ FLAG) (Su...	
11:29:31.596.804.347 5.74us	AFC TCO CReq=0	06		241	2.826.417.393 800.89us	QREQ (READ FLAG)	
11:29:31.596.810.997 5.74us	Filler(2x)			242	2.826.817.846 200.45us	QRESP (READ FLAG) (Su...	
11:29:31.596.815.833 5.73us	AFC TCO CReq=0	06		243	2.827.424.342 806.49us	QREQ (READ FLAG)	
11:29:31.596.821.609 5.77us	Filler(2x)			244	2.827.830.785 206.44us	QRESP (READ FLAG) (Su...	
11:29:31.596.827.315 5.70us	Data Frame TCO			245	2.828.431.308 800.52us	QREQ (READ FLAG)	
11:29:31.596.879.120 51.80...	EOF EVEN	17		246	2.828.832.105 200.79us	QRESP (READ FLAG) (Su...	
11:29:31.596.884.876 5.75us	End of Burst			247	2.829.438.301 806.19us	QREQ (READ FLAG)	
11:29:31.596.884.883 6.66ns	Filler(2x)			248	2.829.845.100 206.79us	QRESP (READ FLAG) (Su...	
11:29:31.596.998.931 114.0...	PREPARE			249	2.830.445.253 800.15us	QREQ (READ FLAG)	
11:29:31.597.027.862 28.93...	Start of Burst			250	2.830.846.353 201.13us	QRESP (READ FLAG) (Su...	
11:29:31.597.027.868 6.66ns	Filler(4x)			251	2.831.452.216 805.82us	QREQ (READ FLAG)	
11:29:31.597.032.528 4.65us	AFC TCO CReq=0	17		252	2.831.859.332 207.11us	QRESP (READ FLAG) (Su...	
11:29:31.597.041.770 9.24us	Data Frame TCO			253	2.832.469.235 799.90us	CMD (TEST UNIT READY)	D
11:29:31.597.051.283 9.51us	STALL			254	2.832.860.692 201.45us	RESPONSE	D
11:29:31.597.106.624 55.34...	EOF EVEN	07		255	2.833.240.377 379.68us	QREQ (READ DESCRIPTOR)	
11:29:31.597.111.270 4.64us	Data Frame TCO			256	2.833.450.076 209.69us	QRESP (READ DESCRIPTO...	
11:29:31.597.152.959 41.68...	EOF EVEN	08		257	2.833.827.315 377.23us	CMD (REQUEST SENSE)	D
11:29:31.597.157.592 4.63us	Filler(4x)			258	2.834.041.770 214.45us	REQUEST_SENSE_RESPON...	D
11:29:31.597.175.584 17.99...	PREPARE			259	2.834.111.270 69.49us	CMD (START STOP UNIT)	D
11:29:31.597.208.560 32.97...	End of Burst			260	2.834.428.705 317.43us	RESPONSE	D
11:29:31.597.208.567 6.66ns	Filler(2x)			261	2.834.645.047 216.34us	RESPONSE	D
11:29:31.597.244.577 36.00...	STALL			262	2.835.441.380 796.33us	CMD (INQUIRY)	D
11:29:31.597.371.111 126.5...	Start of Burst			263	2.835.647.220 205.83us	INQUIRY_RESPONSE	D
11:29:31.597.371.117 6.66ns	Filler(2x)			264	2.835.744.493 97.26us	RESPONSE	D
11:29:31.597.376.997 5.77us	AFC TCO CReq=0	07		265	2.836.062.902 318.41us	QREQ (READ DESCRIPTOR)	
11:29:31.597.382.630 5.73us	Filler(2x)			266	2.836.276.064 213.16us	QRESP (READ DESCRIPTO...	
11:29:31.597.388.379 5.74us	AFC TCO CReq=0	07		267	2.836.810.970 594.90us	QREQ (READ ATTRIBUTE)	
11:29:31.597.394.142 5.76us	Filler(2x)			268	2.837.023.105 212.13us	QRESP (READ ATTRIBUTE...	
11:29:31.597.399.918 5.77us	AFC TCO CReq=0	07		269	2.837.829.438 806.33us	QREQ (READ ATTRIBUTE)	
11:29:31.597.405.654 5.73us	Filler(2x)			270	2.838.034.361 204.92us	QRESP (READ ATTRIBUTE...	
11:29:31.597.411.403 5.74us	AFC TCO CReq=0	08		271	2.838.836.431 802.06us	QREQ (READ DESCRIPTOR)	
11:29:31.597.417.166 5.76us	Filler(2x)			272	2.839.038.024 201.59us	QRESP (READ DESCRIPTO...	
11:29:31.597.422.942 5.77us	AFC TCO CReq=0	08		273	2.839.496.686 498.66us	CMD (TEST UNIT READY)	0
11:29:31.597.428.705 5.76us	Data Frame TCO			274	2.839.694.728 208.04us	RESPONSE	0
11:29:31.597.480.510 51.80...	EOF EVEN	18		275	2.841.782.943 2.08ms	CMD (REQUEST SENSE)	0
11:29:31.597.486.266 5.75us	Filler(2x)			276	2.841.788.047 5.10us	REQUEST_SENSE_RESPON...	0
11:29:31.597.492.002 5.73us	End of Burst			277	2.841.788.767 719.92ns	RESPONSE	0
11:29:31.597.492.009 6.66ns	Filler(2x)			278	2.841.823.555 34.78us	QREQ (READ DESCRIPTOR)	
11:29:31.597.603.491 111.4...	PREPARE			279	2.841.829.351 5.79us	QRESP (READ DESCRIPTO...	

Detail

CMD (START STOP UNIT)

7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

7: [6] Flag Bit= 0
 [5] Flag Bit= 0
 [2] CP= 0
 [1] ATN= Sample (0h)
 2: [7:0] IIN= 208
 3: [7:0] Task Tag= 18h
 4: [7:4] IID= 0
 [3:0] Command Set Type= SCSI Command Set (SBC, SPC) (0h)
 6: [7:0] EHS Length= 00h
 10: [15:0] Data Segment Length= 0000h
 12: [31:0] Expected Data Transfer Length= 00000000h
 16: [7:0] OPERATION CODE= START STOP UNIT (18h)
 [0] IMMED= 0h
 19: [3:0] POWER CONDITION MODIFIER= 0h
 [5:0] POWER CONDITION MODIFIER= 0h
 20: [7:4] POWER CONDITION= 1h
 [2] NO_FLUSH= 0h
 [1] CES= 0h
 [0] START= 0h
 21: [7:0] CONTROL= 00h

0 1 2 3 4 5 6 7 ASCII
 00h 01 00 00 18 00 00 00 00
 08h 00 00 00 00 00 00 00 00
 10h 18 00 00 00 10 00 00 00
 18h 00 00 00 00 00 00 00 00

Unipro

UFS

Detail

4. 使用 32Gb RAM 搭配硬盘串流来储存 Unipro, UFS 通信数据，可完整节录待测物从 PWM Mode 初始化到 High Speed Mode 的流程
5. 提供 Data Filter 功能，可将不必要的数据滤除以节省内存
6. 提供 Search 数据功能
7. 提供 CRC Packet 计算及错误显示
8. Unipro, UFS 命令统计功能，包含封包总数、各类别指令数量以及错误数量统计

Unipro Navigator			UFS Navigator		
Discription	Txns	Bytes	Discription	Txns	Bytes
Unipro			UFS		
L2			SCSI Command	148	
SOF	83257		UFS Protocol	655	
AFC TC0	8318		QUERY REQUEST	34	
AFC TC1	66591		QUERY RESPONSE	34	
NAC	8		TASK MANAGEMENT	0	
COF TC0	0		LUN	799	
EOF EVEN	22		TRANSFER LENGTH	129	
EOF ODD	8318		RESERVED		
L1.5	0				
L1	1252				
HIBERN8	310				
STALL	2				
SLEEP	135				
LINE RESET	19				
LINE CONFIG	0				
PREPARE	0				
PREPARE	154				
Error Packets	13				

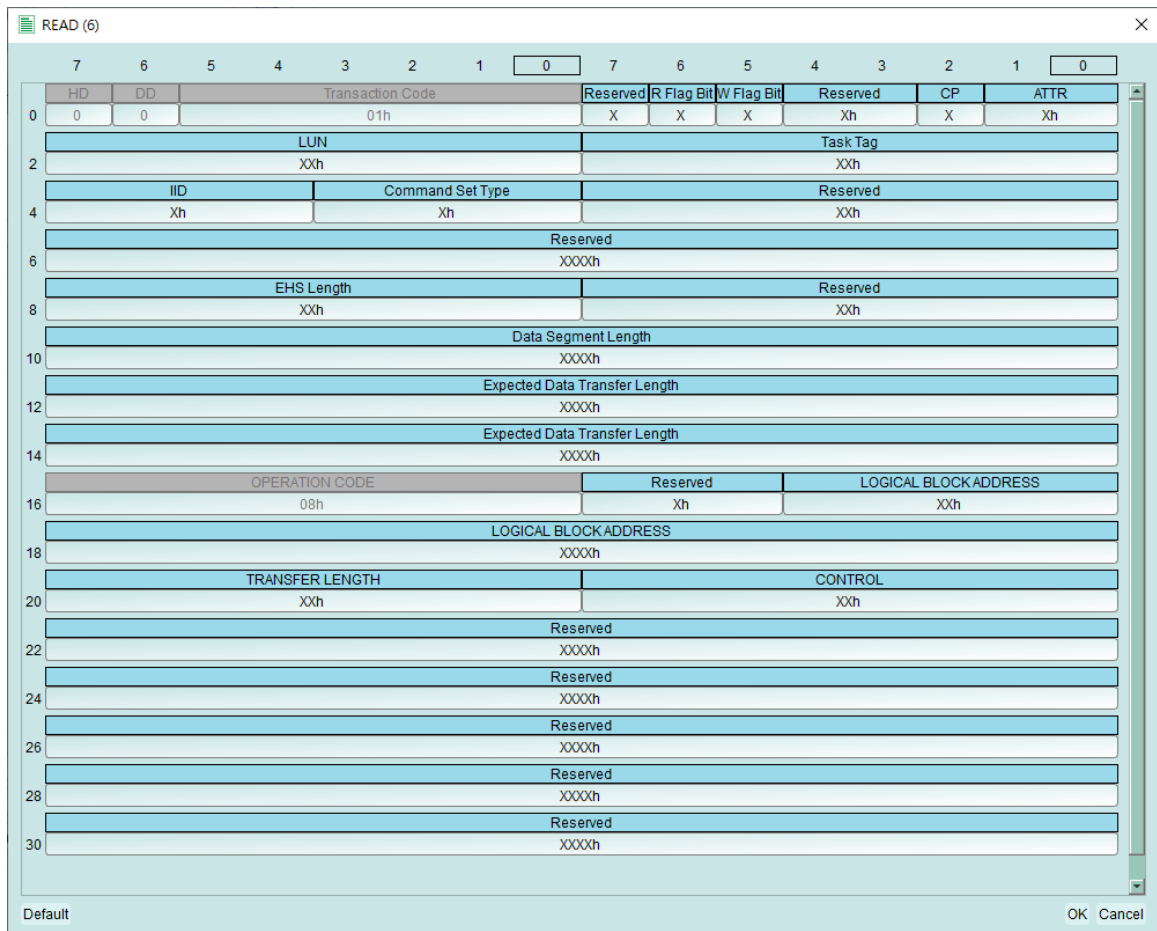
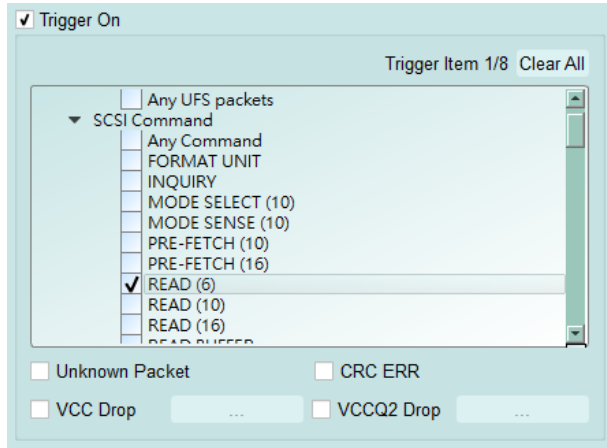
Unipro Statistics			UFS Statistics		
	Txns	Bytes		Txns	Bytes
AFC TC0	66591		NOP OUT	2	
Host	66311		NOP IN	2	
Device	280		RESPONSE	147	
			READ(10) DATA(DATA IN)	496	
			REQUEST SENSE RESPONSE DATA(DATA IN)	7	
			INQUIRY RESPONSE DATA(DATA IN)	1	

Unipro

UFS

9. Unipro, UFS 命令触发功能

- 触发参数包含命令与参数资料可依据不同种类封包填入数值,
- 涵盖所有 Unipro, UFS Packet,
- 可触发 CRC Error, Unknown packet
- 可触发 VCC drop, VCCQ2 drop
- 可透过 Trigger-Out 接孔同步触发外部的示波器



10. 报告区进阶使用方法

- a. 双报告关联:** Unipro 与 UFS 报告互相关联，双击可追踪另一报告区对应资料。
ex: 点击 Unipro 区报告，可关联至 UFS 对应报告。

Timestamp (h:m:s.ms.us.ns dur)	Host	Device	Timestamp	Host	Device	Task Tag	Data
1280	16:15:03.796.342.673 13.33.	Filler(2x)	2				
1281	16:15:03.796.342.703 29.99.	AFC TCO CReq=0	3	16:15:03.783.717.515 0 (Ma...	NOP OUT	00	00 00 00 0
1282	16:15:03.796.342.729 26.66.	Filler(2x)	4	16:15:03.783.838.943 221.4...		00	20 00 00 0
1283	16:15:03.796.342.756 26.66.	AFC TCO CReq=0	5	16:15:03.792.935.487 8.95ms	CMD (TEST UNIT READY)	01	01 00 00 0
1284	16:15:03.796.342.783 26.66.	Filler(2x)	6	16:15:03.792.940.406 4.91us		01	21 00 00 0
1285	16:15:03.796.342.813 29.99.	AFC TCO CReq=0	7	16:15:03.793.956.611 1.01ms	CMD (TEST UNIT READY)	02	01 00 00 0
1286	16:15:03.796.342.839 26.66.	AFC TCO CReq=0	8	16:15:03.793.960.981 4.36us		02	21 00 00 0
1287	16:15:03.796.342.853 53.32.	AFC TCO CReq=0	9	16:15:03.793.985.555 24.57...	CMD (READ (10))	03	01 40 00 0
1288	16:15:03.796.342.906 13.33.	EOF EVEN	10	16:15:03.794.209.246 223.6...		03	22 00 00 0
1289	16:15:03.796.342.919 13.33.	AFC TCO CReq=0	11	16:15:03.794.238.410 29.16...		03	21 00 00 0
1290	16:15:03.796.342.933 13.33.	Filler(6x)	12	16:15:03.794.310.372 71.96...	CMD (READ (10))	04	01 40 00 0
1291	16:15:03.796.342.976 43.32.	Filler(4x)	13	16:15:03.794.372.383 62.01...		04	22 00 00 0
1292	16:15:03.796.343.029 53.32.	AFC TCO CReq=0	14	16:15:03.794.401.583 29.16...		04	21 00 00 0
1293	16:15:03.796.343.056 26.66.	Filler(2x)	15	16:15:03.796.251.568 1.95ms	CMD (READ (10))	05	01 40 00 0
1294	16:15:03.796.343.086 29.99.	AFC TCO CReq=0	16	16:15:03.796.313.495 61.92...		05	22 00 00 0
1295	16:15:03.796.343.112 26.66.	Filler(6x)	17	16:15:03.796.342.659 29.16...		05	21 00 00 0
1296	16:15:03.796.343.306 193.3.	AFC TCO CReq=0	18	16:15:03.796.362.107 19.44...	CMD (READ (10))	06	01 40 00 0
1297	16:15:03.796.343.332 26.66.	Filler(2x)	19	16:15:03.796.424.391 62.28...		06	22 00 00 0
1298	16:15:03.796.343.359 26.66.	AFC TCO CReq=0	20	16:15:03.796.453.551 29.16...		06	21 00 00 0
1299	16:15:03.796.343.386 26.66.	Filler(2x)	21	16:15:03.796.491.171 37.61...	CMD (READ (10))	07	01 40 00 0
1300	16:15:03.796.343.412 26.66.	AFC TCO CReq=0	22	16:15:03.796.553.098 61.92...		07	22 00 00 0
1301	16:15:03.796.343.442 29.99.	Filler(6x)	23	16:15:03.796.582.262 29.16...		07	21 00 00 0
1302	16:15:03.796.362.107 18.66.	Data Frame TCO	24	16:15:03.796.592.558 10.29...	CMD (READ (10))	08	01 40 00 0
1303	16:15:03.796.362.354 246.6.	EOF EVEN	25	16:15:03.796.655.115 62.55...		08	22 00 00 0
1304	16:15:03.796.362.381 26.66.	Filler(4x)	26	16:15:03.796.684.275 29.16...		08	21 00 00 0
1305	16:15:03.796.363.270 889.5.	AFC TCO CReq=0	27	16:15:03.797.375.309 691.0...	CMD (READ (10))	09	01 40 00 0
1306	16:15:03.796.363.324 53.32.	Filler(6x)	28	16:15:03.797.450.942 75.63...		09	22 00 00 0
1307	16:15:03.796.363.350 26.66.	AFC TCO CReq=0	29	16:15:03.797.480.105 29.16...		09	22 00 00 0
1308	16:15:03.796.363.407 56.66.	Filler(4x)	30	16:15:03.797.509.266 29.16...		09	22 00 00 0
1309	16:15:03.796.424.351 60.98.	Data Frame TCO	31	16:15:03.797.539.430 29.16...		09	22 00 00 0
1310	16:15:03.796.426.281 1.89us	EOF EVEN	32	16:15:03.797.567.593 29.16...		09	22 00 00 0
1311	16:15:03.796.426.307 26.66.	Data Frame TCO	33	16:15:03.797.596.754 29.16...		09	22 00 00 0
1312	16:15:03.796.426.681 373.2.	AFC TCO CReq=0	34	16:15:03.797.625.918 29.16...		09	22 00 00 0
1313	16:15:03.796.426.707 26.66.	Filler(2x)	35	16:15:03.797.655.081 29.16...		09	22 00 00 0
1314	16:15:03.796.426.734 26.66.	AFC TCO CReq=0	36	16:15:03.797.684.242 29.16...		09	22 00 00 0
1315	16:15:03.796.426.764 29.99.	Filler(2x)	37	16:15:03.797.713.405 29.16...		09	22 00 00 0
1316	16:15:03.796.426.791 26.66.	AFC TCO CReq=0	38	16:15:03.797.742.566 29.16...		09	22 00 00 0
1317	16:15:03.796.426.817 26.66.	Filler(2x)	39	16:15:03.797.771.730 29.16...		09	22 00 00 0
1318	16:15:03.796.426.844 26.66.	AFC TCO CReq=0	40	16:15:03.797.800.893 29.16...		09	22 00 00 0
1319	16:15:03.796.426.871 26.66.	AFC TCO CReq=0	41	16:15:03.797.830.054 29.16...		09	22 00 00 0
1320	16:15:03.796.426.927 56.66.	AFC TCO CReq=0	42	16:15:03.797.859.218 29.16...		09	22 00 00 0
1321	16:15:03.796.426.954 26.66.	AFC TCO CReq=0	43	16:15:03.797.888.381 29.16...		09	22 00 00 0
1322	16:15:03.796.427.011 56.66.	Filler(4x)	44	16:15:03.797.917.542 29.16...		09	22 00 00 0
1323	16:15:03.796.428.201 1.18us	EOF EVEN	45	16:15:03.797.946.705 29.16...		09	22 00 00 0

- b. 统计列表:** 以统计功能快速分类并可追踪数据位置

The screenshot shows the Acute software interface. The top window displays a data capture table with columns for Timestamp, Host, Device, and Task Tag. A red box highlights the 'Report List' menu option, with the text '开启统计列表' (Enable Statistics List) next to it. The bottom window shows a 'Statistics List' table with columns for Line No., Timestamp, Host, Device, LUN, Task Tag, and Data. The table lists various data points and their corresponding statistics.

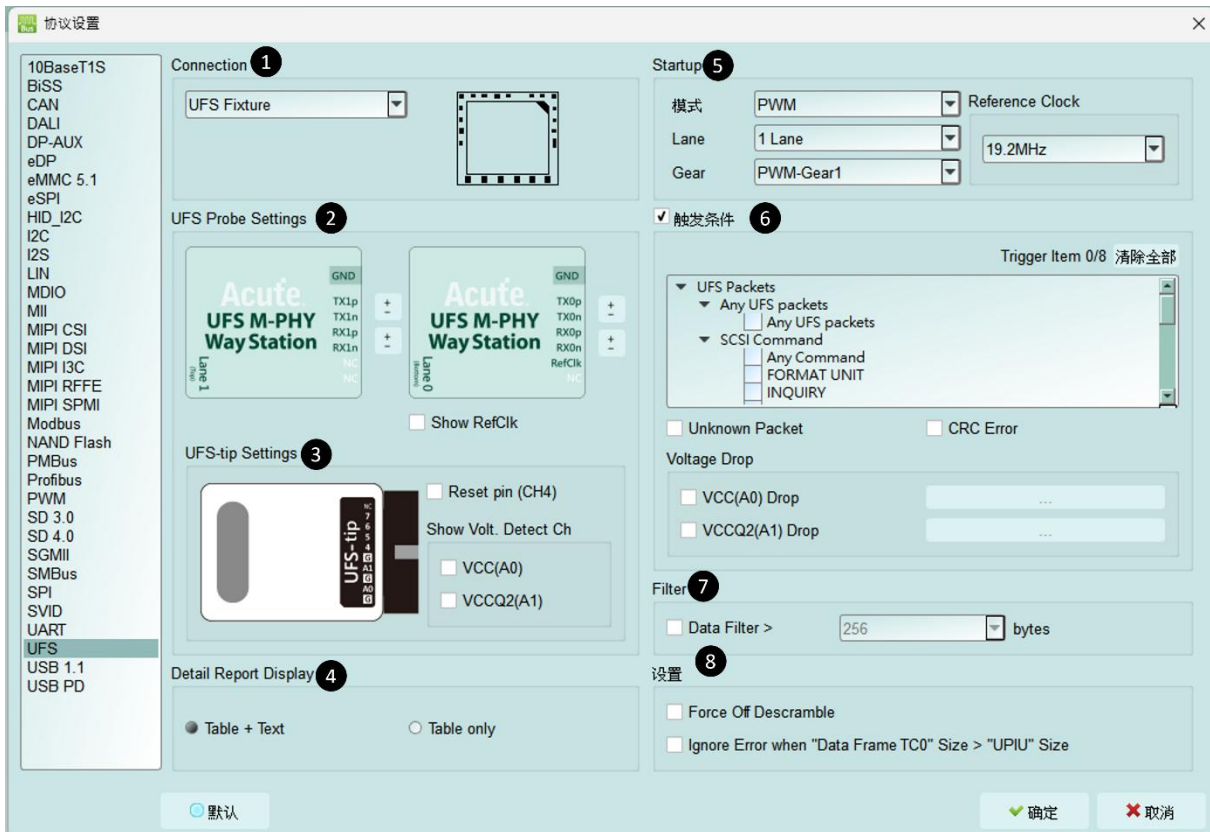
Line No.	Timestamp	Host	Device	LUN	Task Tag	Data
227	2.833.627.315 0	CMD (REQUEST SENSE)		00	17	0000
275	2.841.782.943 7.95ms	CMD (REQUEST SENSE)		00	1F	0000
293	2.843.338.161 1.55ms	CMD (REQUEST SENSE)		01	26	0000
311	2.844.730.048 1.39ms	CMD (REQUEST SENSE)		02	2D	0000
329	2.846.085.925 1.39ms	CMD (REQUEST SENSE)		03	34	0000
347	2.847.449.333 1.36ms	CMD (REQUEST SENSE)		04	3B	0000

The screenshot displays the Acute BufFinder (Ver:1.5.57, Demo mode) interface. The main window shows a list of captured events with columns for Timestamp, Host, Device, and Start of Burst. A Navigator window on the right provides a summary of UFS transactions, including SCSI Command, UFS Protocol, and various UFS commands like QUERY REQUEST, QUERY RESPONSE, TASK MANAGEMENT, LUN, TRANSFER LENGTH, and RESERVED. A Statistics window below the Navigator shows counts for specific commands such as CMD (TEST UNIT READY), CMD (READ (10)), CMD (REQUEST SENSE), CMD (START STOP UNIT), and CMD (INQUIRY). At the bottom, a detailed packet list shows individual transactions with columns for Line No., Timestamp, Host, Device, LUN, Task Tag, Data Segment Len., Logical Block Addr., Transfer Length, and Data.

Line No.	Timestamp	Host	Device	LUN	Task Tag	Data Segment Len.	Logical Block Addr.	Transfer Length	Data
257	2.833.827.315.0		DO	17	0000			01 40 D0 L...	
275	2.844.782.943.3.99ms		DO	1F	0000			01 40 00 L...	
283	2.844.330.161.1.55ms		DO	26	0000			01 40 01 L...	
311	2.844.730.048.1.39ms		DO	2D	0000			01 40 02 L...	
329	2.846.088.925.1.35ms		DO	34	0000			01 40 03 L...	
347	2.847.449.333.1.36ms		DO	3B	0000			01 40 04 L...	

从UFS的统计数据追寻至Unipro原始数据的过程

11. UFS Settings



1. **Connection:** 需选择 BF7264B+/Pro 与待测物的连接方式
2. **UFS Probe Settings:** 可交换同一 Lane 之 p/n; 可选择是否要显示 RefClk 量测数据
3. **UFS-tip Settings:**
 - a. 可开启 UFS Reset pin 之判断, 需接上 reset pin 于 UFS probe 之 LA tip CH4 位置. 当协议分析收到 Reset 信号时, 就会重置 Power mode 回到 PWM mode.
 - b. 打开电压侦测之后, 当电压有变化时会显示所侦测到的电压值
4. **Detail Report Display:** 可选择是否需要文字描述的解析方式
5. **Startup:** 需设置于撷取当下, 待测物所运行之模式; 必须设置 Reference Clock, 可选择 19.2 / 26 / 38.4 / 52 MHz 选项 (无论 RefClk 信号是否有接上, 此数值都必须正确设置, 不然信号分析可能会出现错误)
6. **Trigger On:** 可设置 Unipro/UFS packets, 共 8 组, 以及 Unknown Packet, CRC Error 触发选项, 另加入两组电压侦测可使用
7. **Filter:** 开启后将会滤除大于设置值之封包后方数据
8. 设置:
 - **Force Off Descramble:** 勾选时, 不进行解扰(Descramble), 只呈现扰码(Scramble)的结果。

- Ignore Error when “Data Frame TC0” size > “UPIU” size: 勾选时，当“Data Frame TC0”的大小大于“UPIU”的大小时，忽略错误。

FAQ

1. 支持 UFS 第几版的规格，是否有 Differential 对数或 port 数限制呢？

A：MIPI M-PHY 3.0, Up to 5.8Gbps (Gear 3, Rate A / B), 2 Lanes
MIPI Unipro 1.8
JEDEC UFS 2.1
JEDEC UFS 3.1 commands

2. 量测时是否会影响信号质量？

A：外接的仪器量测必然会有部分的负载效应影响，我们采用 SMPM Coaxial Cable 的连接方式来降低对待测物干扰并提升信号质量。

3. 是否有支持信号发送 (Tx) 功能？

A：不支持信号发送功能

4. 量测时须注意的事项

a. 接线问题判断与排除方法：

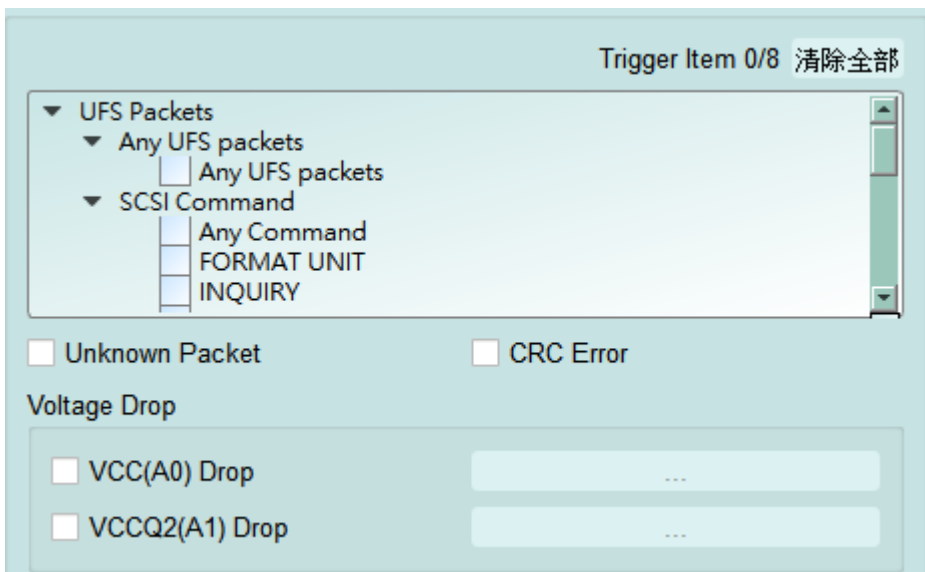
请确实按手册探头与待测物连接方式进行连接。若量测起来 PWM 正常，但无法看到任何 HS data 或只能上 1 Lane 而无法上 2 Lane 时，就应先检查接线是否有错误。

b. Reference clock 设置方式：

在 Settings 有提供 Ref Clk 19.2MHz(default) / 26MHz / 38.4MHz / 52MHz 四个选项。若不清楚所使用的 Ref clk 为何时，可按下列方式做判断。若 PWM 正常，但 HS Data 都是错误的，请尝试调整 Ref Clk 为其他速率再抓一次。

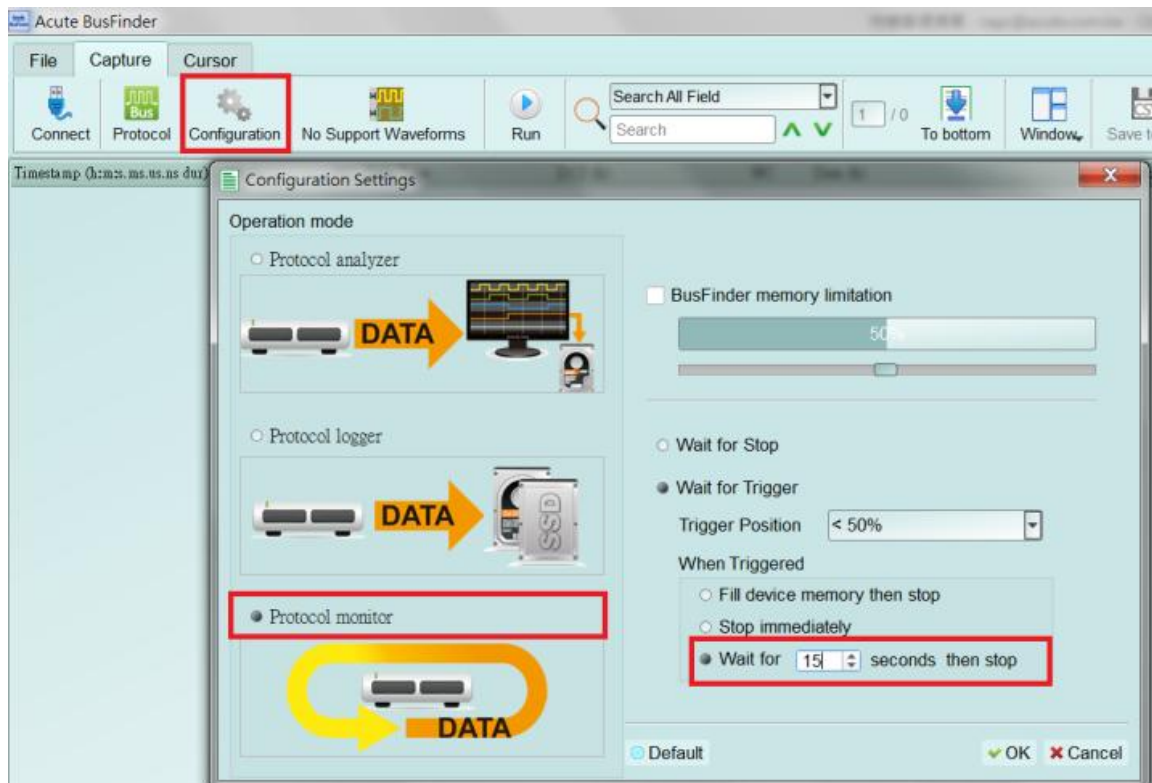
5. 有指定某个 Unipro, UFS packet 做为 trigger 点的功能吗？

A：可以指定特定的 Unipro, UFS packet 或是 Error 进行触发。



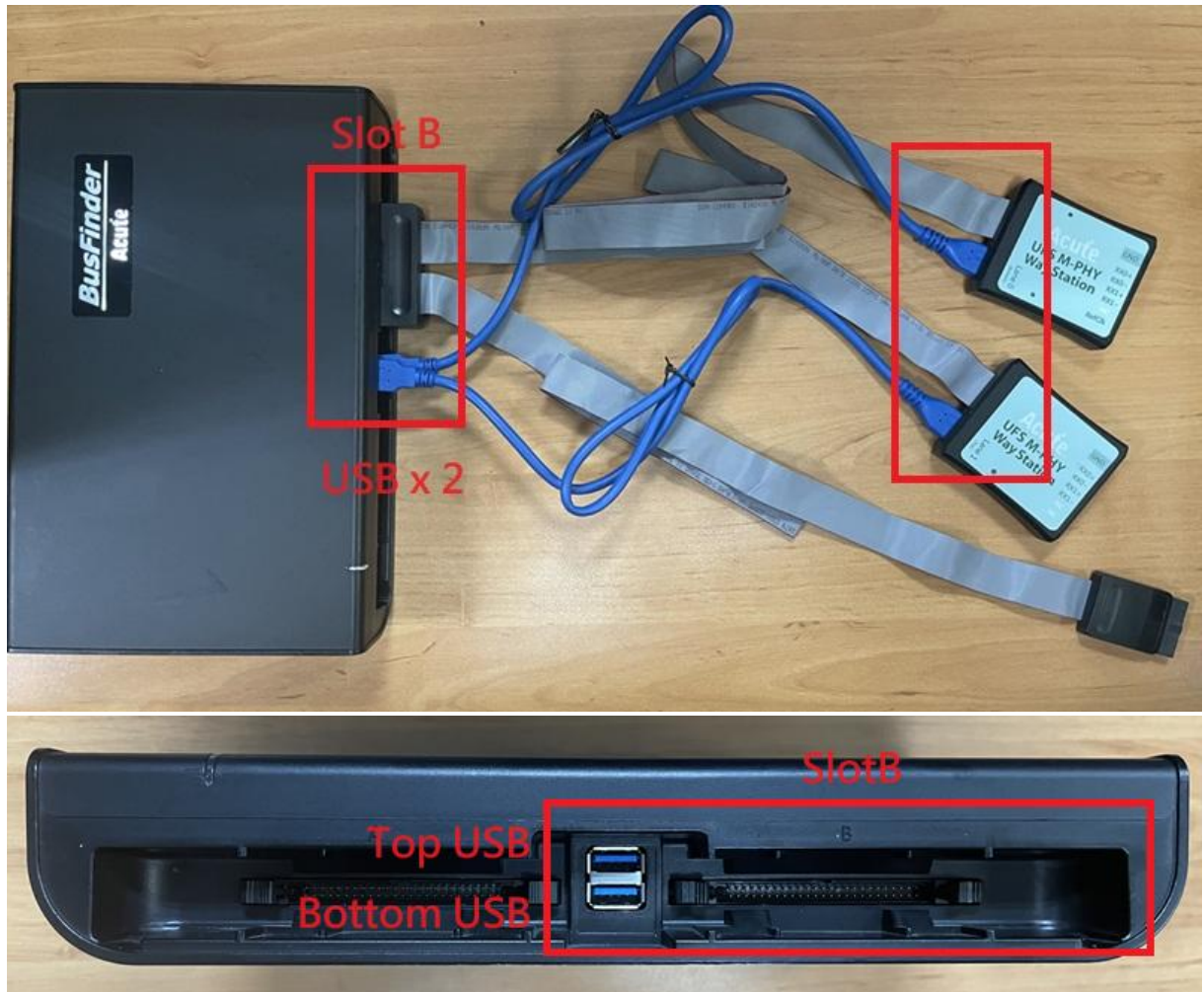
6. 是否可以自行设置一个 Unipro, UFS 起始点，指定抓取多少时间内的 Data?

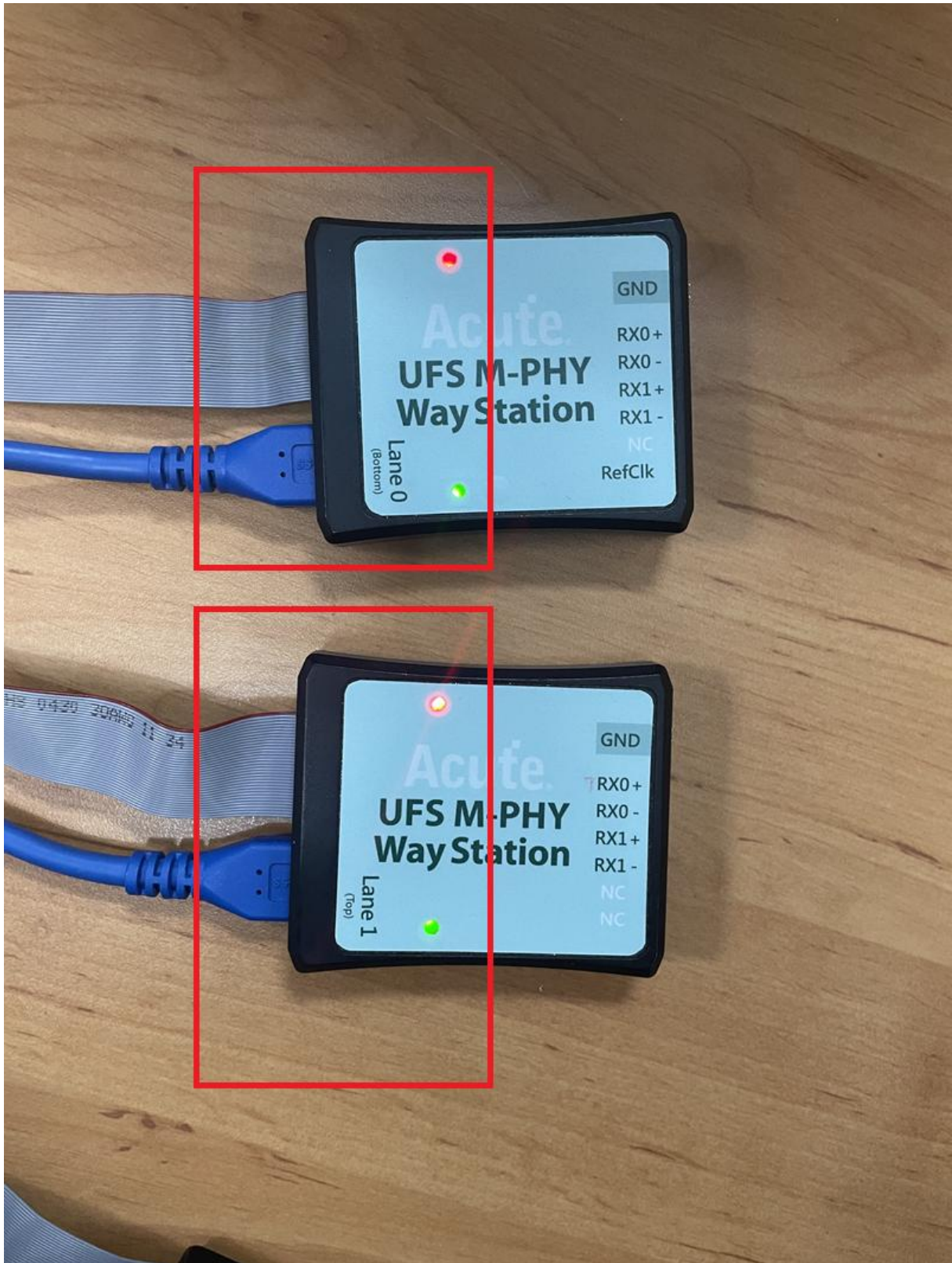
A: 可以将起始条件设置在触发项目后，到工作模式选单内调整为数据监控仪模式，并指定撷取时间长度。



主机与探头连接方式

主机仅能使用 Slot B 作为探头连接槽，并注意主机前端的两个 USB 插槽也需要连接至 Way Station 上，且上方 USB 对应 Top Way Station，下方 USB 对应 Bottom Way Station，不可接错，否则将无法量测。连接后请注意两个 Way Station 灯号是否皆有亮起红灯跟绿灯各一。





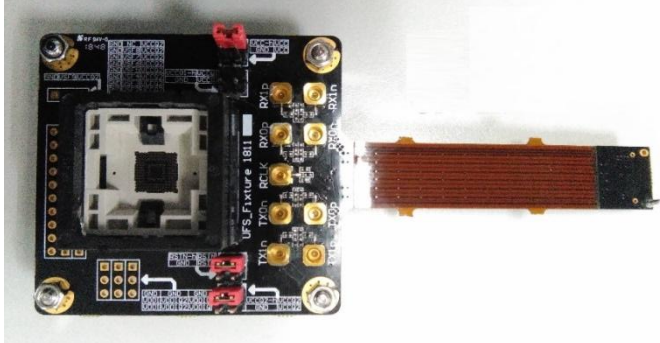
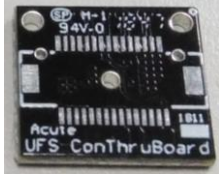

探头与待测物连接方式

a. 使用 UFS Fixture (连接器)方式连接

使用时机：

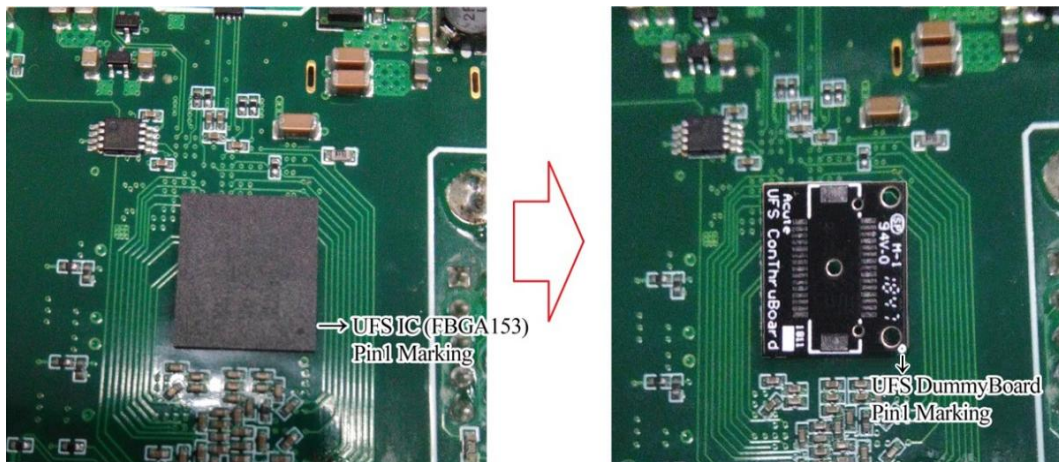
若 Host 有多套时可用连接器的方式，方便更换 Host 与 UFS Chip，以及不需要跳线直接使用 SMPM Cable 连接 Way Station。

由于连接器使用软扁平电缆延伸信号，只适合应用于 UFS Chip 周边组件不干涉的情况。

零件列表	
1. 连接器主板(Con Fixture)	
2. 连接器小板(Con Dummy Board)	 <p style="color: red;">背面需植 0.3mm 锡球</p>
3. 连接器 DF17-30DS-0.5V (HiRose Connector)	

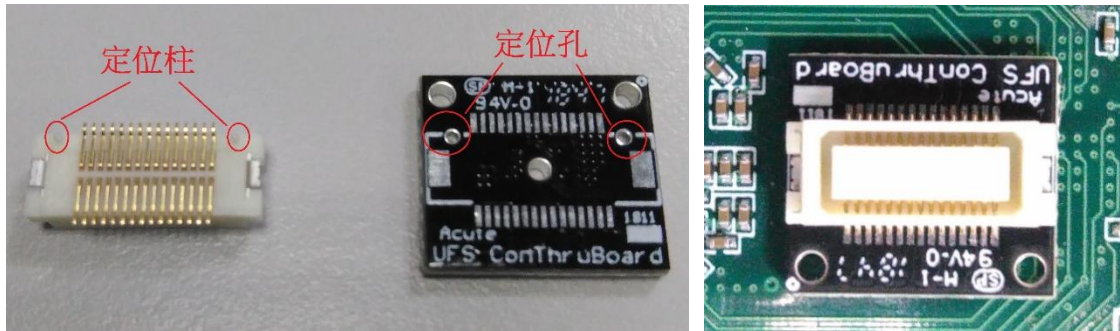
Step1: 将待测物上的 UFS Chip 拔起，拔起来的 UFS Chip 需重新植锡球。

Step2: 将连接器小板，焊在已拆下 UFS Chip 位置。



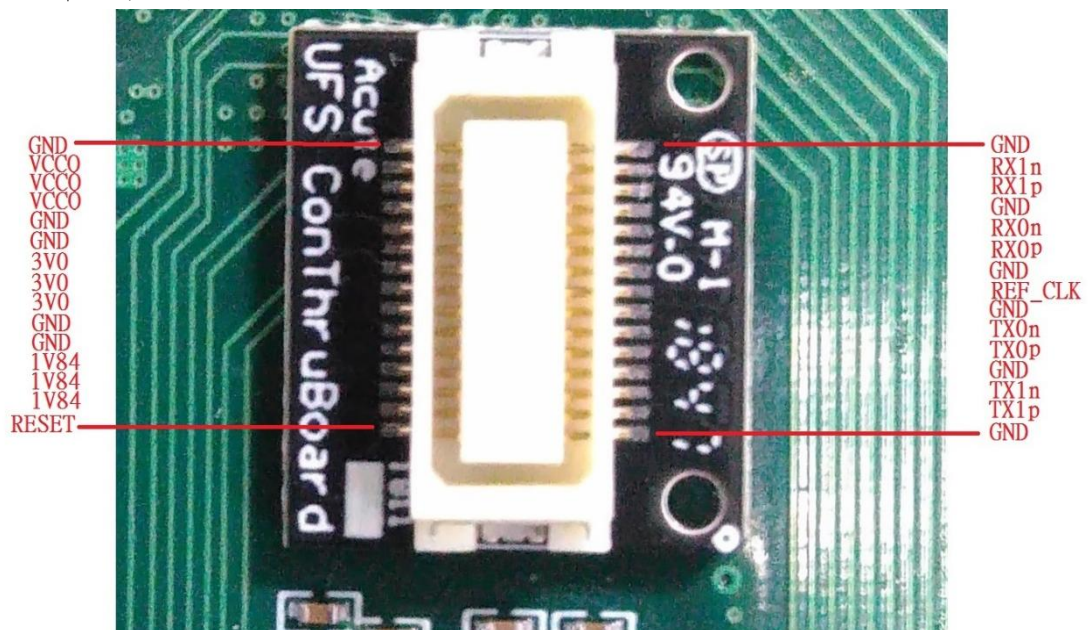
焊接连接器小板时请注意 Pin1 方向

Step3: 将连接器(DF17-30DS-0.5V)放在连接器小板上，在焊接之前请先注意连接器背后定位柱方向与小板定位孔位置

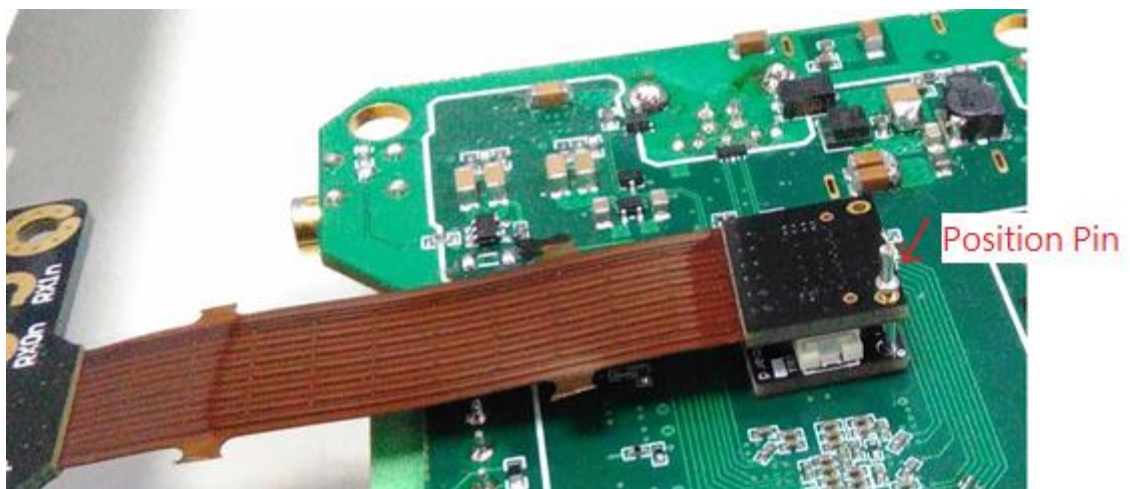


Step4: 连接器放置小板确认完成开始焊接，焊接完成后确认 pin 脚之间有无短路。

Pin 脚名称如下图



Step5: 连接主板，连接前请先注意主板连接器上定位针与小板定位孔位置

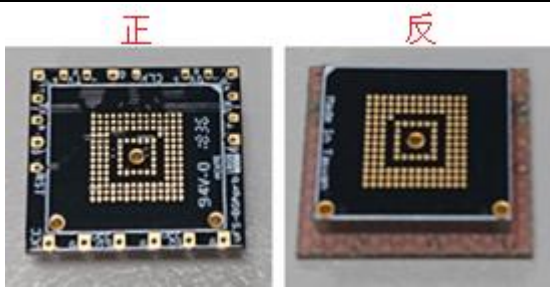
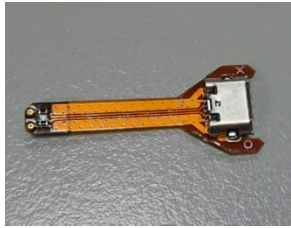
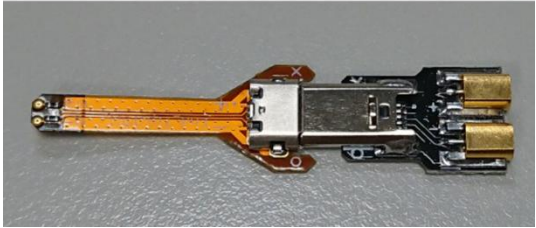
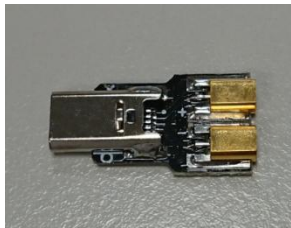


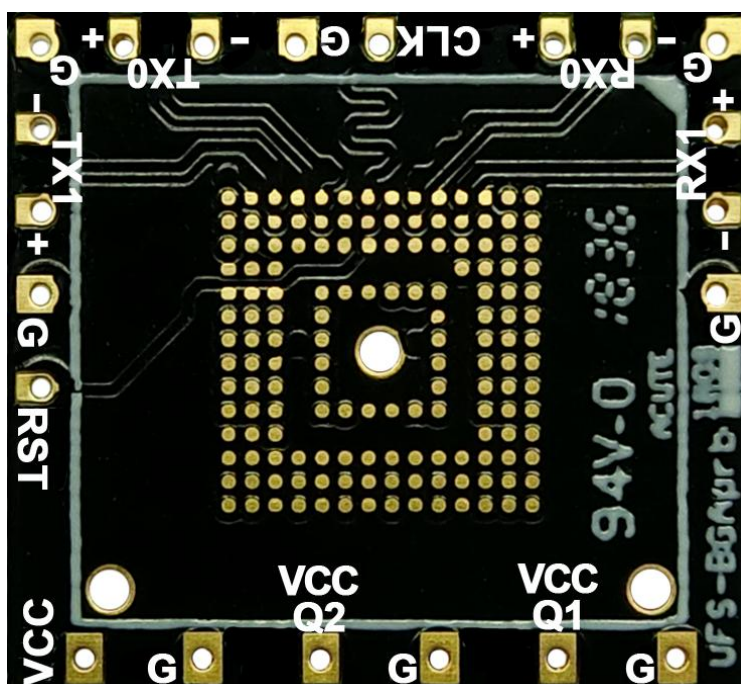
Step6: 将拔起来的 UFS Chip 放进连接器主板 UFS Socket (FBGA153 Socket)，完成。

b. 使用增高板搭配 End-tip 方式连接

使用时机：

若原 UFS Chip 周边组件干涉，无法使用 UFS Fixture 时以及 UFS Chip 周边没有测试点(Test point)可进行跳线时，就需拔除原 UFS Chip，以增高板垫高之后再再从测试点接上 End-tip 后再使用 SMPM Cable 连接 Way Station。

零件列表		
增高板		
End-tip 软板		<p>組合完成</p> 
End-tip 软板连接器		



增高板脚位图

c. 使用 End-tip 方式连接

使用时机：

若待测板已留有测试点(Test point)可进行跳线时，可直接使用 End-tip 接上测试，就不需使用增高板。

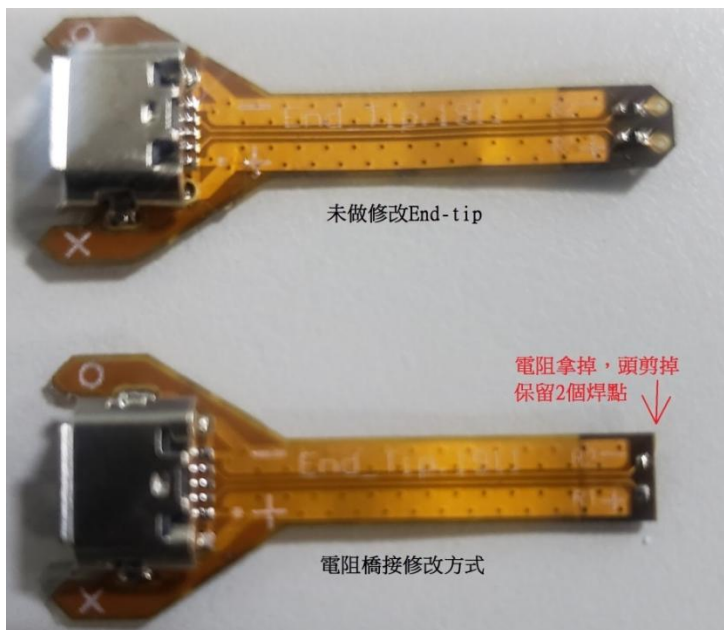
UFS 标配的 End-tip 软板上面的电阻为 250ohm，一般的情况下可直接使用。

若希望缩短跳线距离以提升信号质量，可按照下列方式以电阻桥接的方式处理即可。

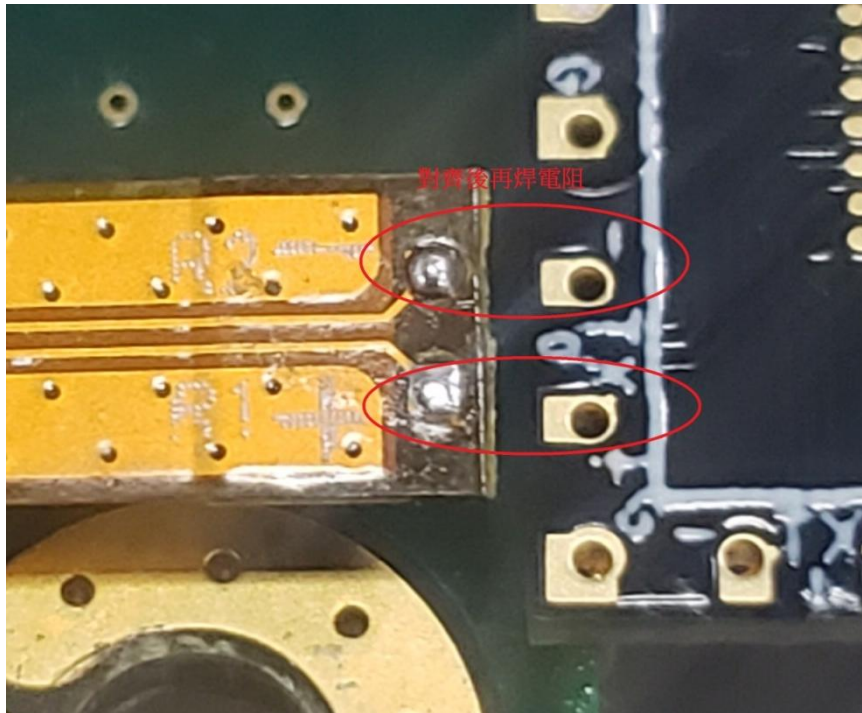
若要不跳线利用电阻桥接方式(如下图)，End-tip 就要做修改。

修改流程：

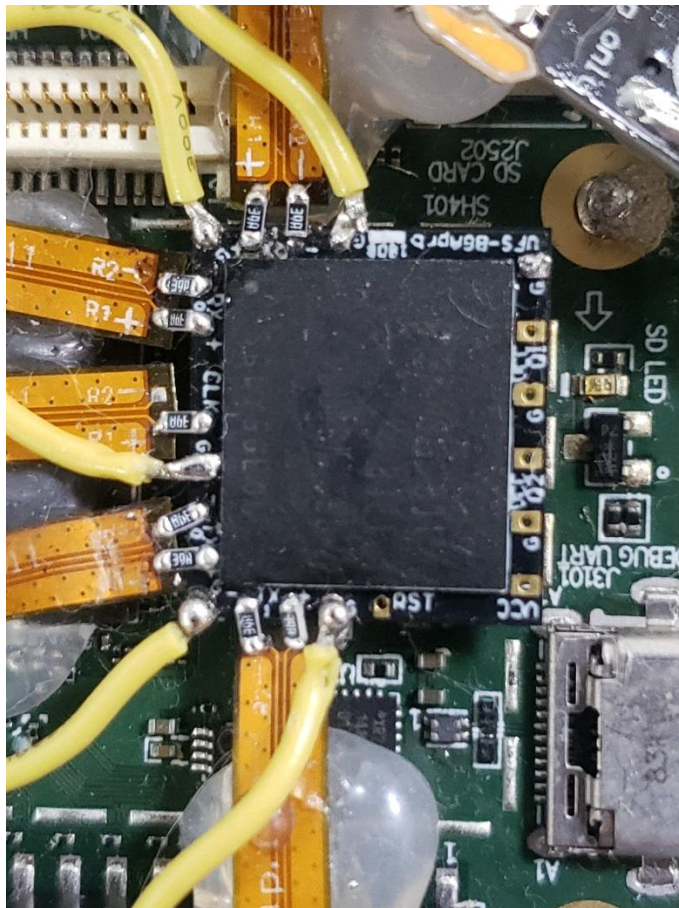
Step1: 电阻拿掉，头剪掉，保留 2 个焊点。

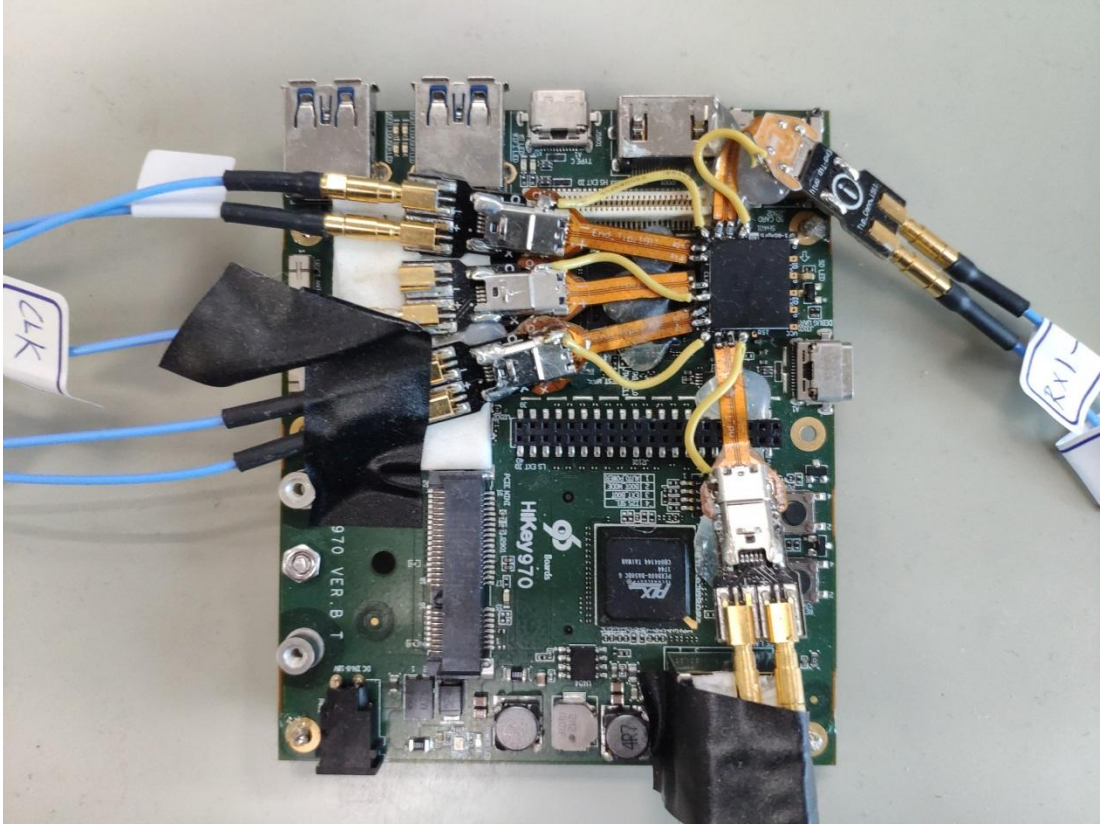


Step2: 改完后 End-tip 上面的 P/N 焊点与增高板的 P/N 焊点对齐，对齐后再将电阻 250ohm 焊上去，4 组 data +1 条 clk 焊完后再焊接地线。



完成示意图。此种方式因距离最短使得信号质量会比 End-tip 跳线连接的方式来的好。





Way Station 连接

1. UFS Probe 请安装于 BusFinder 7264B+/Pro 的 Slot B 插槽
2. Way Station 转接盒各有一个 USB Type B 插孔，请使用对应之 USB Cable 安装于主机正面插孔。安装时，请按照 Way Station 铭板标示之 Top/Botom 安装即可。

