



BF7264B SGMII
方案说明

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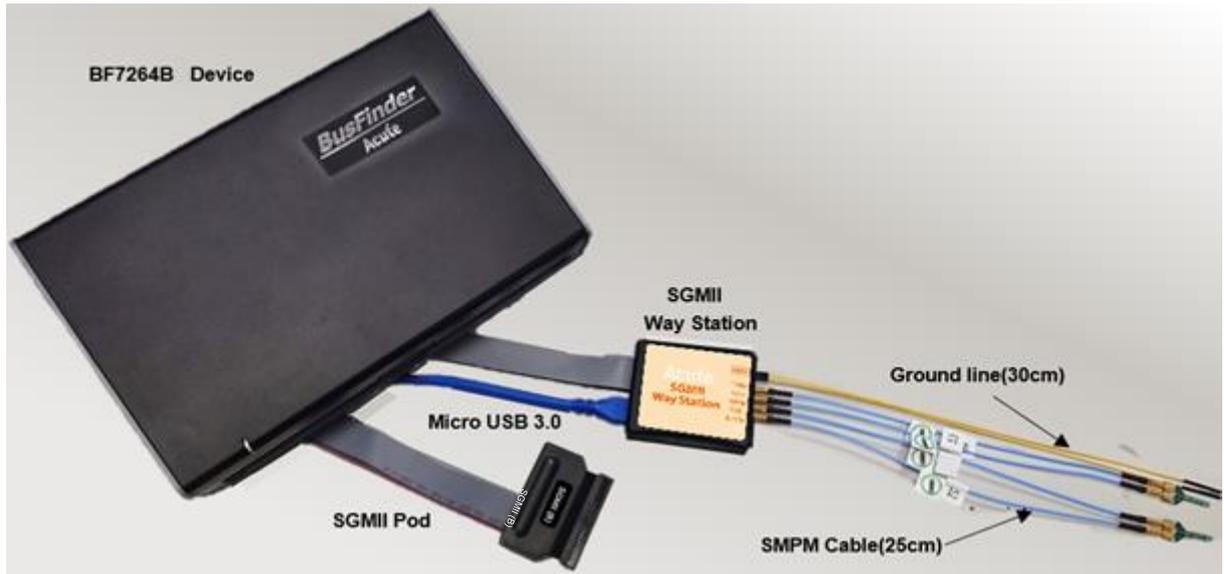
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概况

此方案仅于 BF7264B 产品适用，除主机可继续使用原 BF6264B 功能外，增加 SGMII 分析仪功能。

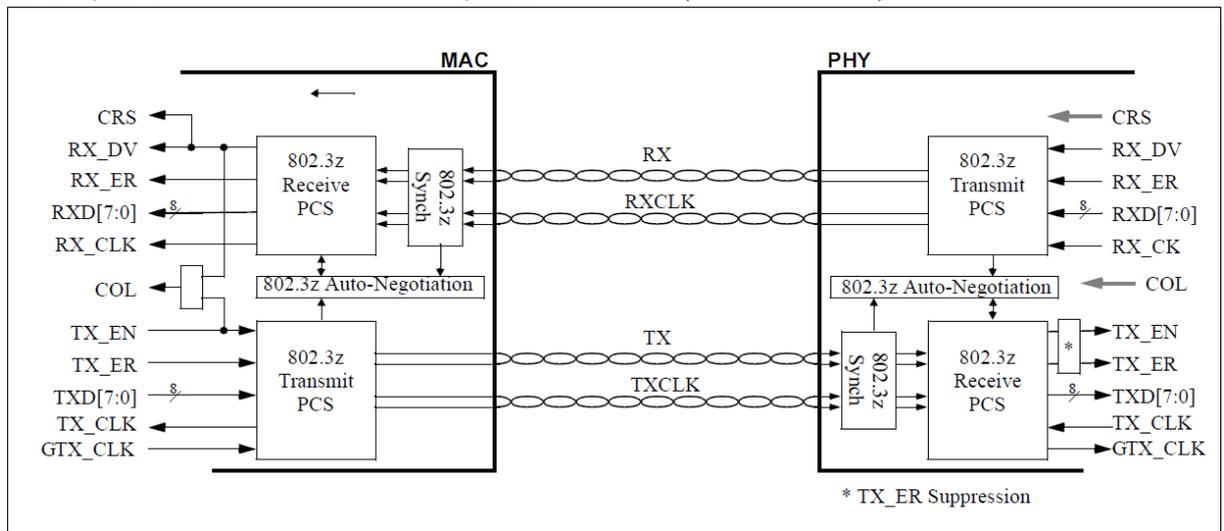
SGMII 方案，规格内容如下：

1. BF7264B，32Gb RAM，搭配 SGMII 探头组



2. 支持速度 1000/100/10MHz SGMII:

资料速度为 1.25 Gbaud，Clock 速度为 625 MHz (DDR interface).



3. 可同时显示 PCS(PHY)及 GMII(MAC)协议封包数据以表格方式呈现，包含指令解析

Timestamp (hh:mm:ss.nnn)	Tx Code	Rx Code	Tx 'Rx' Tx Set	Rx Set	Timestamp (hh:mm:ss.nnn)	Destination Address	Source Address	EtherType	Data
20467	10123136.754.069.396	3.33ms	D16.2	50	21	00-E0-4C-60-7B-82	04-D4-C4-4A-42-9D	0800	45 00 00
20468	10123136.754.069.396	0.00ms	K20.5	BC	22	00-E0-4C-60-7B-82	04-D4-C4-4A-42-9D	0800	45 00 00
20469	10123136.754.069.399	3.33ms	D16.2	50	23	00-E0-4C-60-7B-82	04-D4-C4-4A-42-9D	0800	45 00 00
20470	10123136.754.069.406	6.66ms	K20.5	BC	24	00-E0-4C-60-7B-82	04-D4-C4-4A-42-9D	0800	45 00 00
20471	10123136.754.069.409	3.33ms	D16.2	50	25	00-E0-4C-60-7B-82	04-D4-C4-4A-42-9D	0800	45 00 00
20472	10123136.754.069.409	0.00ms	K20.5	BC	26	00-E0-4C-60-7B-82	04-D4-C4-4A-42-9D	0800	45 00 00
20473	10123136.754.069.413	3.33ms	D16.2	50	27	00-E0-4C-60-7B-82	04-D4-C4-4A-42-9D	0800	45 00 00
20474	10123136.754.069.419	6.66ms	K20.5	BC	28	00-E0-4C-60-7B-82	04-D4-C4-4A-42-9D	0800	45 00 00
20475	10123136.754.069.423	3.33ms	D16.2	50	29	00-E0-4C-60-7B-82	04-D4-C4-4A-42-9D	0800	45 00 00
20476	10123136.754.069.423	0.00ms	K20.5	BC	30	00-E0-4C-60-7B-82	04-D4-C4-4A-42-9D	0800	45 00 00
20477	10123136.754.069.426	3.33ms	D16.2	50	31	00-E0-4C-60-7B-82	04-D4-C4-4A-42-9D	0800	45 00 00
20478	10123136.754.069.433	6.66ms	K20.5	BC	32	00-E0-4C-60-7B-82	04-D4-C4-4A-42-9D	0800	45 00 00
20479	10123136.754.069.436	3.33ms	D16.2	50	33	00-E0-4C-60-7B-82	04-D4-C4-4A-42-9D	0800	45 00 00
20480	10123136.754.069.436	0.00ms	K20.5	BC	34	00-E0-4C-60-7B-82	04-D4-C4-4A-42-9D	0800	45 00 00
20481	10123136.754.069.439	3.33ms	D16.2	50	35	00-E0-4C-60-7B-82	04-D4-C4-4A-42-9D	0800	45 00 00
20482	10123136.754.069.446	6.66ms	K20.5	BC	36	00-E0-4C-60-7B-82	04-D4-C4-4A-42-9D	0800	45 00 00
20483	10123136.754.069.449	3.33ms	D16.2	50	37	00-E0-4C-60-7B-82	04-D4-C4-4A-42-9D	0800	45 00 00
20484	10123136.754.069.449	0.00ms	K20.5	BC	38	00-E0-4C-60-7B-82	04-D4-C4-4A-42-9D	0800	45 00 00
20485	10123136.754.069.459	3.33ms	D16.2	50	39	00-E0-4C-60-7B-82	04-D4-C4-4A-42-9D	0800	45 00 00
20486	10123136.754.069.463	6.66ms	K20.5	BC	40	00-E0-4C-60-7B-82	04-D4-C4-4A-42-9D	0800	45 00 00
20487	10123136.754.069.463	3.33ms	D16.2	50	41	00-E0-4C-60-7B-82	04-D4-C4-4A-42-9D	0800	45 00 00
20488	10123136.754.069.463	0.00ms	K27.7	FB	42	00-E0-4C-60-7B-82	04-D4-C4-4A-42-9D	0800	45 00 00
20489	10123136.754.069.463	0.00ms	D16.2	50	43	00-E0-4C-60-7B-82	04-D4-C4-4A-42-9D	0800	45 00 00
20490	10123136.754.069.466	3.33ms	D21.2	55	44	00-E0-4C-60-7B-82	04-D4-C4-4A-42-9D	0800	45 00 00
20491	10123136.754.069.473	6.66ms	K20.5	BC	45	00-E0-4C-60-7B-82	04-D4-C4-4A-42-9D	0800	45 00 00
20492	10123136.754.069.476	3.33ms	D21.2	55	46	00-E0-4C-60-7B-82	04-D4-C4-4A-42-9D	0800	45 00 00
20493	10123136.754.069.476	0.00ms	D16.2	50	47	00-E0-4C-60-7B-82	04-D4-C4-4A-42-9D	0800	45 00 00
20494	10123136.754.069.479	3.33ms	D21.2	55	48	00-E0-4C-60-7B-82	04-D4-C4-4A-42-9D	0800	45 00 00
20495	10123136.754.069.486	6.66ms	K20.5	BC	49	00-E0-4C-60-7B-82	04-D4-C4-4A-42-9D	0800	45 00 00
20496	10123136.754.069.489	3.33ms	D21.2	55	50	00-E0-4C-60-7B-82	04-D4-C4-4A-42-9D	0800	45 00 00
20497	10123136.754.069.489	0.00ms	D16.2	50	51	00-E0-4C-60-7B-82	04-D4-C4-4A-42-9D	0800	45 00 00
20498	10123136.754.069.493	3.33ms	D21.2	55	52	00-E0-4C-60-7B-82	04-D4-C4-4A-42-9D	0800	45 00 00
20499	10123136.754.069.499	6.66ms	K20.5	BC	53	00-E0-4C-60-7B-82	04-D4-C4-4A-42-9D	0800	45 00 00
20500	10123136.754.069.503	3.33ms	D21.2	55	54	00-E0-4C-60-7B-82	04-D4-C4-4A-42-9D	0800	45 00 00
20501	10123136.754.069.503	0.00ms	D16.2	50	55	00-E0-4C-60-7B-82	04-D4-C4-4A-42-9D	0800	45 00 00
20502	10123136.754.069.506	3.33ms	D21.6	DS	56	00-E0-4C-60-7B-82	04-D4-C4-4A-42-9D	0800	45 00 00
20503	10123136.754.069.513	6.66ms	K20.5	BC	57	00-E0-4C-60-7B-82	04-D4-C4-4A-42-9D	0800	45 00 00
20504	10123136.754.069.516	3.33ms	D0.0	50	58	00-E0-4C-60-7B-82	04-D4-C4-4A-42-9D	0800	45 00 00
20505	10123136.754.069.516	0.00ms	D16.2	50	59	00-E0-4C-60-7B-82	04-D4-C4-4A-42-9D	0800	45 00 00
20506	10123136.754.069.519	3.33ms	D0.7	50	60	00-E0-4C-60-7B-82	04-D4-C4-4A-42-9D	0800	45 00 00
20507	10123136.754.069.526	6.66ms	K20.5	BC	61	00-E0-4C-60-7B-82	04-D4-C4-4A-42-9D	0800	45 00 00

Detail

Direction: TX
 Address:
 Destination: 00-E0-4C-60-7B-82
 Source : 04-D4-C4-4A-42-9D
 EtherType: IPv4 (0800)
 FCS: 3963A0D1

[Raw Data]

	0	1	2	3	4	5	6	7	ASCII
00h	45	00	00	40	DD	CB	00	00	E..@....
08h	80	11	D9	8B	C0	A8	01	02
10h	C0	A8	01	03	04	00	04	D2
18h	00	2C	BA	B9	54	52	49	47	...,TRIG
20h	30	30	30	30	30	30	30	30	00000000
28h	31	31	31	31	31	31	31	31	11111111
30h	32	32	32	32	32	32	32	32	22222222
38h	33	33	33	33	33	33	33	33	33333333

4. 使用 32Gb RAM 搭配硬盘串流来储存 PCS, GMII 通讯数据
5. 提供 Data Filter 与 Idle Filter 功能，可将不必要的的数据滤除以节省内存

Filter

Data Filter Range: 14~1475 bytes.

CRC is not available with data filter.

Must reserve Address and Ethertype bytes.

Data filter > bytes

Idle filter

6. 提供 Search 数据功能

7. 提供 CRC Packet 计算及错误显示

8. PCS, GMII 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

Navigator			Navigator		
Discription	Txns	Bytes	Discription	Txns	Bytes
▼ PCS			▼ GMII		
Tx	38239		▼ Errors	1	
Rx	40337		Frame Error	0	
			CRC Error	1	
			▼ Destination Address	2	
			00-E0-4C-60-7B-82	119	
			04-D4-C4-4A-42-9D	90	
			▼ Source Address	2	
			04-D4-C4-4A-42-9D	119	
			00-E0-4C-60-7B-82	90	
Statistics			Statistics		
	Txns	Bytes		Txns	Bytes
▼ Configuration /C/	0		▼ 04-D4-C4-4A-42-9D		
CFG_REG1 /C1/	0		▼ Direction	90	
CFG_REG2 /C2/	0		TX	0	
▼ IDLE /I/	37846		RX	90	
IDLE1 /I1/	62				
IDLE2 /I2/	37784				
▼ LP /L/	0				
LPI1 /LI1/	0				
LPI2 /LI2/	0				
▼ Encapsulation	393				
CAR_EXTEND /R/	131				
SPD /S/	131				
EPD /T/	131				
ERR_PROP /V/	0				
▼ Error	0				
Disparity	0				
Not in table	0				

9. SGMII 命令触发功能

- a. 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,
- b. 涵盖所有 PCS, GMII Packet,
- c. 可触发 CRC Error, Frame Error, Propagation Error, Start of Packet, End of Packet, Carrier Extend, Configuration
- d. 可透过 Trigger-Out 接孔同步触发外部的示波器

Trigger On

Direction:

PCS

Start of Packet (K27_7, SPD) End of Packet (K29_7, EPD)

Carrier Extend (K23_7) Propagation Error (K30_7)

Disparity Error Not in Table

Configuration (K28_5, D21_5 / K28_5, D2_2)

GMII

Frame Error CRC Error

Data Trigger

Direction for Data:

PCS Configuration Register

GMII Data

GMII Trigger Settings

Destination Address

- - - - -

Source Address

- - - - -

Ethertype/Length

Data

Byte 1: Byte 2: Byte 3: Byte 4:

Byte 5: Byte 6: Byte 7: Byte 8:

Data Offset:

Default

10. 报告区进阶使用方法

a. **双报告关联:** PCS 与 GMII 报告互相关联，双击可追踪另一报告区对应资料。

ex: 点击 PCS 区报告，可关联至 GMII 对应报告。

Timestamp (h:m:s.ms.us.ns dur)	Tx Code	Rx Code	Rx Tx Set	Rx Set
10:23:36.754.077.652 3.33ns	D16.2	50		
10:23:36.754.077.658 6.66ns				
10:23:36.754.077.658 6.00ns	K23.7	F7		SPD / S/
10:23:36.754.077.662 3.33ns	D21.2	55		
10:23:36.754.077.666 3.33ns	K28.5	BC	IDLE2 / I2/	
10:23:36.754.077.672 6.66ns	D16.2	55		
10:23:36.754.077.678 3.33ns	D21.2	55		
10:23:36.754.077.678 3.33ns	D21.2	55		
10:23:36.754.077.678 3.33ns	D21.2	55		
10:23:36.754.077.686 6.66ns	K28.5	BC	IDLE2 / I2/	
10:23:36.754.077.686 6.66ns	D16.2	50		
10:23:36.754.077.692 3.33ns	D21.2	55		
10:23:36.754.077.692 3.33ns	D16.2	50		
10:23:36.754.077.696 6.66ns	D21.2	55		
10:23:36.754.077.702 0.00ns	D16.2	55		
10:23:36.754.077.702 0.00ns	K28.5	BC	IDLE2 / I2/	
10:23:36.754.077.712 6.66ns	D4.0	04		
10:23:36.754.077.712 6.66ns	D0.6	04		
10:23:36.754.077.718 3.33ns	K28.5	BC	IDLE2 / I2/	
10:23:36.754.077.718 3.33ns	D16.2	50		
10:23:36.754.077.726 6.66ns	D4.6	C4		
10:23:36.754.077.726 3.33ns	D10.2	4A		
10:23:36.754.077.726 0.00ns	K28.5	BC	IDLE2 / I2/	
10:23:36.754.077.732 3.33ns	D16.2	50		
10:23:36.754.077.738 6.66ns	D2.2	42		
10:23:36.754.077.742 3.33ns	D29.4	9D		
10:23:36.754.077.742 0.00ns	K28.5	BC	IDLE2 / I2/	
10:23:36.754.077.742 3.33ns	D16.2	50		
10:23:36.754.077.752 6.66ns	D0.0	00		
10:23:36.754.077.752 3.33ns	D0.7	00		
10:23:36.754.077.752 0.00ns	K28.5	BC	IDLE2 / I2/	
10:23:36.754.077.752 3.33ns	D16.2	50		
10:23:36.754.077.766 6.66ns	D12.2	4C		
10:23:36.754.077.766 3.33ns	D0.3	60		
10:23:36.754.077.766 0.00ns	K28.5	BC	IDLE2 / I2/	
10:23:36.754.077.772 3.33ns	D16.2	50		
10:23:36.754.077.778 6.66ns	D27.3	7B		
10:23:36.754.077.782 3.33ns	D2.4	82		
10:23:36.754.077.782 0.00ns	K28.5	BC	IDLE2 / I2/	

Timestamp (h:m:s.ms.us.ns dur)	Dir	Destination Address	Source Address	EtherData
10:23:36.754.041.919 3.27us	TX	00-E0-4C-60-7B-82	04-D4-C4-4A-42-9D	0800 45 00 C
10:23:36.754.044.385 2.46us	RX	04-D4-C4-4A-42-9D	00-E0-4C-60-7B-82	0800 45 00 C
10:23:36.754.047.545 3.15us	TX	00-E0-4C-60-7B-82	04-D4-C4-4A-42-9D	0800 45 00 C
10:23:36.754.050.358 2.81us	RX	04-D4-C4-4A-42-9D	00-E0-4C-60-7B-82	0800 45 00 C
10:23:36.754.052.118 1.75us	TX	00-E0-4C-60-7B-82	04-D4-C4-4A-42-9D	0800 45 00 C
10:23:36.754.055.477 3.35us	RX	04-D4-C4-4A-42-9D	00-E0-4C-60-7B-82	0800 45 00 C
10:23:36.754.056.517 1.03us	TX	00-E0-4C-60-7B-82	04-D4-C4-4A-42-9D	0800 45 00 C
10:23:36.754.061.400 4.88us	TX	00-E0-4C-60-7B-82	04-D4-C4-4A-42-9D	0800 45 00 C
10:23:36.754.065.066 3.66us	TX	00-E0-4C-60-7B-82	04-D4-C4-4A-42-9D	0800 45 00 C
10:23:36.754.066.570 1.50us	RX	04-D4-C4-4A-42-9D	00-E0-4C-60-7B-82	0800 45 00 C
10:23:36.754.069.466 2.89us	TX	00-E0-4C-60-7B-82	04-D4-C4-4A-42-9D	0800 45 00 C
10:23:36.754.072.542 3.07us	RX	04-D4-C4-4A-42-9D	00-E0-4C-60-7B-82	0800 45 00 C
10:23:36.754.074.359 1.85us	TX	00-E0-4C-60-7B-82	04-D4-C4-4A-42-9D	0800 45 00 C
10:23:36.754.077.662 3.26us	RX	04-D4-C4-4A-42-9D	00-E0-4C-60-7B-82	0800 45 00 C
10:23:36.754.078.385 723.2	TX	00-E0-4C-60-7B-82	04-D4-C4-4A-42-9D	0800 45 00 C
10:23:36.754.083.634 5.24us	RX	04-D4-C4-4A-42-9D	00-E0-4C-60-7B-82	0800 45 00 C
10:23:36.754.087.704 4.06us	TX	00-E0-4C-60-7B-82	04-D4-C4-4A-42-9D	0800 45 00 C
10:23:36.754.088.754 1.04us	RX	04-D4-C4-4A-42-9D	00-E0-4C-60-7B-82	0800 45 00 C
10:23:36.754.091.477 2.72us	TX	00-E0-4C-60-7B-82	04-D4-C4-4A-42-9D	0800 45 00 C
10:23:36.754.094.727 3.24us	RX	04-D4-C4-4A-42-9D	00-E0-4C-60-7B-82	0800 45 00 C
10:23:36.754.096.357 1.62us	TX	00-E0-4C-60-7B-82	04-D4-C4-4A-42-9D	0800 45 00 C
10:23:36.754.100.876 4.51us	TX	00-E0-4C-60-7B-82	04-D4-C4-4A-42-9D	0800 45 00 C
10:23:36.754.104.982 4.10us	TX	00-E0-4C-60-7B-82	04-D4-C4-4A-42-9D	0800 45 00 C
10:23:36.754.105.819 836.5	RX	04-D4-C4-4A-42-9D	00-E0-4C-60-7B-82	0800 45 00 C
10:23:36.754.109.755 3.93us	TX	00-E0-4C-60-7B-82	04-D4-C4-4A-42-9D	0800 45 00 C
10:23:36.754.111.792 2.03us	RX	04-D4-C4-4A-42-9D	00-E0-4C-60-7B-82	0800 45 00 C
10:23:36.754.114.528 2.73us	TX	00-E0-4C-60-7B-82	04-D4-C4-4A-42-9D	0800 45 00 C
10:23:36.754.116.911 2.38us	RX	04-D4-C4-4A-42-9D	00-E0-4C-60-7B-82	0800 45 00 C
10:23:36.754.118.101 1.18us	TX	00-E0-4C-60-7B-82	04-D4-C4-4A-42-9D	0800 45 00 C
10:23:36.754.123.301 5.19us	TX	00-E0-4C-60-7B-82	04-D4-C4-4A-42-9D	0800 45 00 C
10:23:36.754.126.887 3.58us	TX	00-E0-4C-60-7B-82	04-D4-C4-4A-42-9D	0800 45 00 C
10:23:36.754.128.003 1.11us	RX	04-D4-C4-4A-42-9D	00-E0-4C-60-7B-82	0800 45 00 C
10:23:36.754.132.006 4.00us	TX	00-E0-4C-60-7B-82	04-D4-C4-4A-42-9D	0800 45 00 C
10:23:36.754.133.976 1.96us	RX	04-D4-C4-4A-42-9D	00-E0-4C-60-7B-82	0800 45 00 C
10:23:36.754.135.593 1.61us	TX	00-E0-4C-60-7B-82	04-D4-C4-4A-42-9D	0800 45 00 C
10:23:36.754.140.139 4.54us	TX	00-E0-4C-60-7B-82	04-D4-C4-4A-42-9D	0800 45 00 C
10:23:36.754.145.068 4.92us	RX	04-D4-C4-4A-42-9D	00-E0-4C-60-7B-82	0800 45 00 C
10:23:36.754.149.098 4.02us	TX	00-E0-4C-60-7B-82	04-D4-C4-4A-42-9D	0800 45 00 C
10:23:36.754.151.041 1.94us	RX	04-D4-C4-4A-42-9D	00-E0-4C-60-7B-82	0800 45 00 C
10:23:36.754.153.991 2.94us	TX	00-E0-4C-60-7B-82	04-D4-C4-4A-42-9D	0800 45 00 C
10:23:36.754.156.161 2.16us	RX	04-D4-C4-4A-42-9D	00-E0-4C-60-7B-82	0800 45 00 C

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 with three main windows:

- Capture Window:** Displays a list of network traffic events with columns for Timestamp, Tx Code, Rx Code, Rx Tx Set, and Rx Set. A red box highlights a specific entry.
- Statistics Window:** Shows a tree view of statistics for the selected entry, including Configuration, IDLE, LP, and Encapsulation. A red box highlights the 'CAR_EXTEND / R/' entry.
- Search List Window:** Displays a list of search results for the selected entry, with columns for Line No, Timestamp, Tx Code, Rx Code, Tx Set, and Rx Set. A red box highlights the search results for 'CAR_EXTEND / R/'.

11. SGMII settings



- 1. SGMII way station settings:** 可交换同一 Lane 之 p, n，选择是否需要 Ref CLK
- 2. Startup Settings:** 需设定于撷取当下，待测物所运行的速度模式
- 3. Filter:** 开启后将会滤除大于设定值之封包后方数据或是 Idle 封包
- 4. Trigger On:** 可设置 GMII/PCS packets、CRC Error、Frame Error、Propagation Error、Start of Packet、End of Packet、Carrier Extend、Configuration、Disparity Error、Configuration、Not in Table 触发设置

FAQ

1. 支持 SGMII 的规格，是否有 Differential 对数或 port 数限制呢？

A：支持到 SGMII 1Gbps、100Mbps、10Mbps，Ports: TXp、TXn、RXp、RXn、Ref.Clk。

2. 量测时是否会影响讯号质量？

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讯号质量。

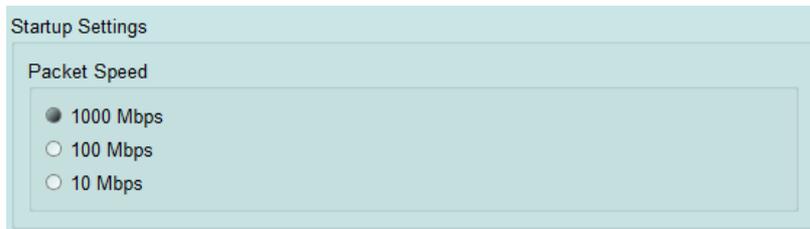
3. 是否有支持讯号发送 (Tx) 功能？

A：不支持讯号发送功能

4. 量测时须注意的事项

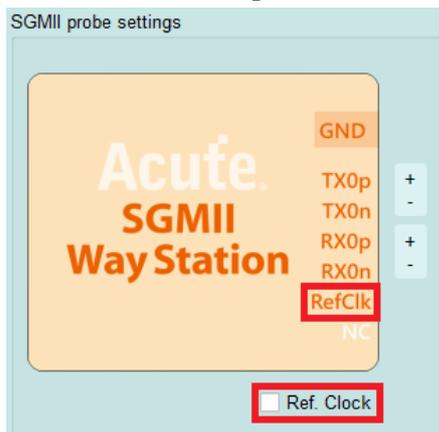
a. 起始设置用法：

因为 SGMII 有支持不同的封包速度，若没有正确设定初始速度，会造成 Data 数据量变为 10 倍或是 100 倍，使得分析结果异常。另外，若在撷取的过程中有 Speed Config 封包出现，则会以 Config 封包资料作为新的封包速度。



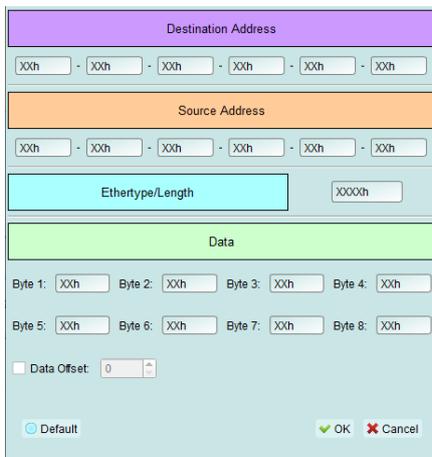
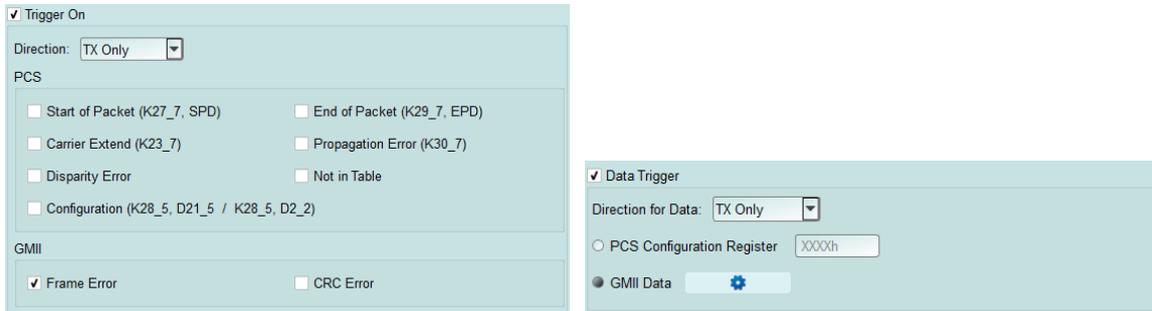
b. Reference clock 设置方式：

由于 SGMII 采用 8b10b 编码模式，测量时可不用连接 Reference clock 就可正常分析，另外，若有需要外部 RefClk，在 Settings 有提供 Ref Clk，可由下方 SGMII Way Station 标示接入 Ref Clk port，并选择 Ref. Clock。



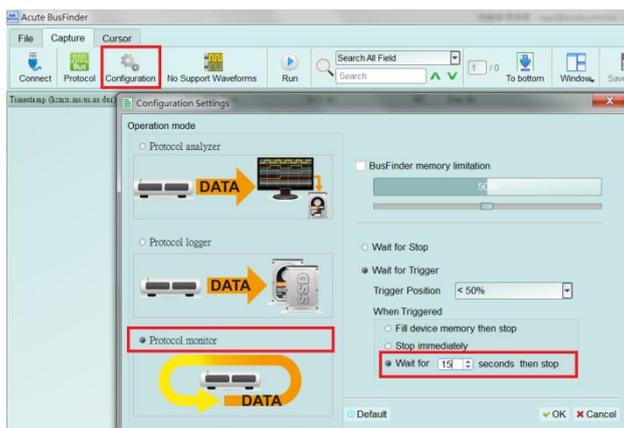
5. 有指定某个 PCS, GMII packet 做为 trigger 点的功能吗?

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



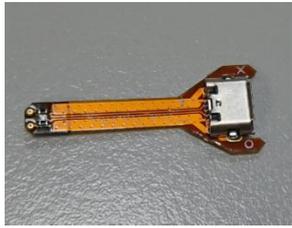
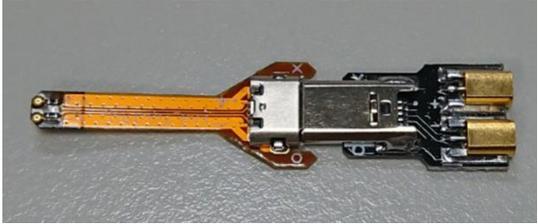
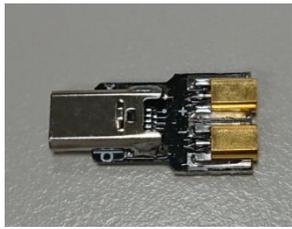
6. 是否可以自行设定一个 PCS, GMII 起始点，指定抓取多少时间内的 Data?

A: 可以将起始条件设定在触发项目后，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。



探头与待测物连接方式

End-Tip 方式连接:

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

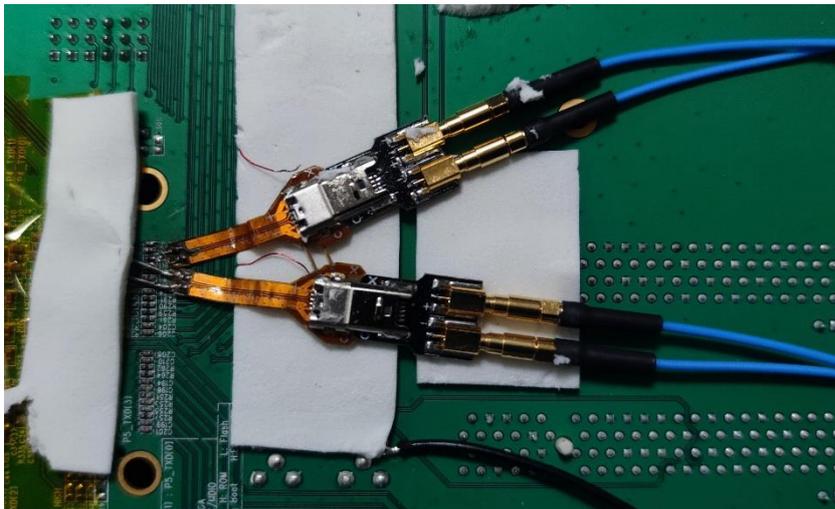
End-tip 软板上面的电阻为 250ohm。

脚位连接

需接在下方的 USB3.0 port



End-tip 实际接线:



Way Station 接线

