



# **BF7264B SGMII Solution**

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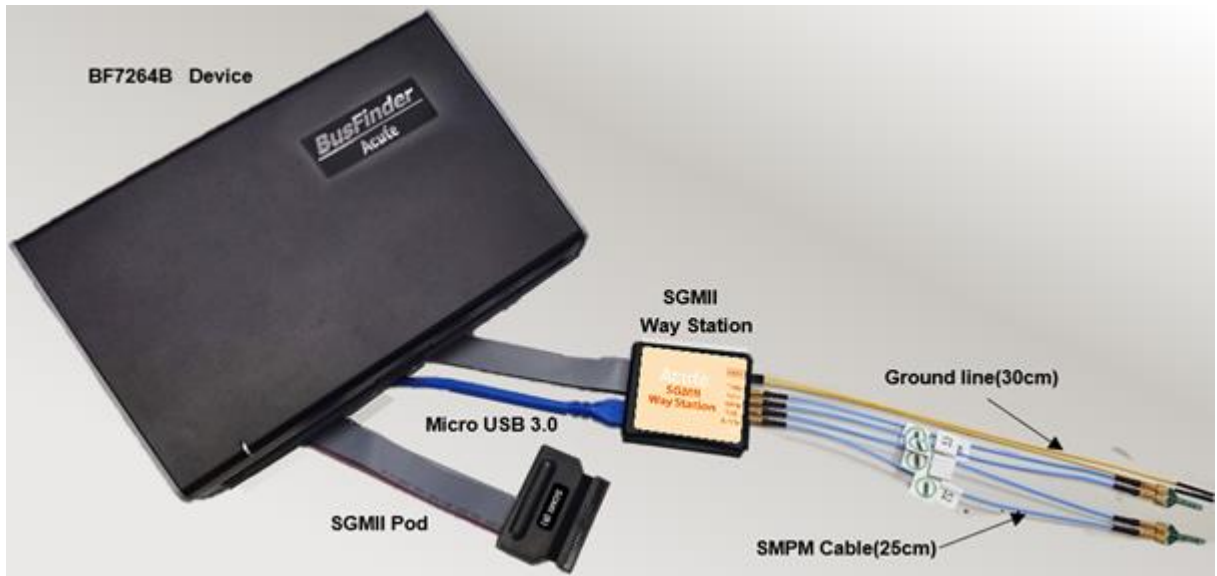
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## Feature:

The BF7264B is an SGMII analyzer and offers other protocol analyzer options like eMMC5, NAND flash, SD3, SD4 or MIPI D-PHY(DSI, CSI) as its predecessor.

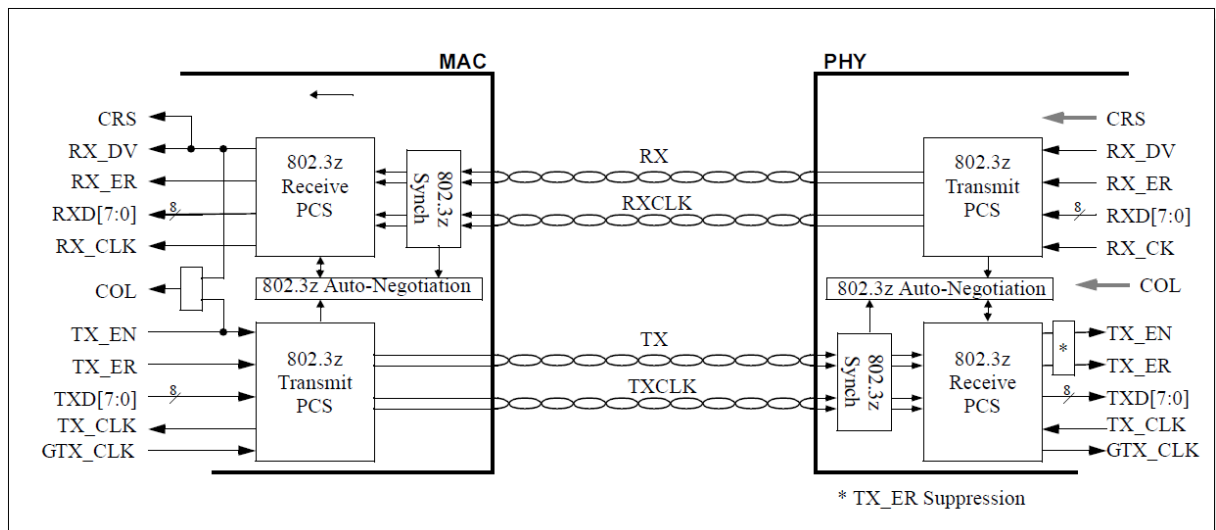
Specifications:

### 1. BF7264B, 32Gb RAM, SGMII Probes



### 2. Supports 1000/100/10Mbps SGMII:

Data signals operate at 1.25 Gbaud and the clocks operate at 625 MHz (a DDR interface).



### 3. Can simultaneously display PCS(PHY) or GMII(MAC) protocol packet data in tabular form, including command parsing.

Timestamp (h:m:s.ms.us.ns dur)	Tx Code	Rx Code	Tx/Rx Set	Rx Set	Direction	Destination Address	Source Address	EtherType
20847	10123136.754.069.396 3.33ns	D16.2	50		TX	00-E0-4C-60-7B-82	04-D4-C4-4A-42-9D	0800 45 00 00
20848	10123136.754.069.396 0.00ns	K20.5	50		BC			
20849	10123136.754.069.399 3.33ns	D16.2	50		IDLE2 /12/			
20850	10123136.754.069.406 6.66ns	K20.5	50		BC			
20851	10123136.754.069.409 3.33ns	D16.2	50		IDLE2 /12/			
20852	10123136.754.069.409 0.00ns	K20.5	50		BC			
20853	10123136.754.069.413 3.33ns	D16.2	50		IDLE2 /12/			
20854	10123136.754.069.419 6.66ns	K20.5	50		BC			
20855	10123136.754.069.423 3.33ns	D16.2	50		IDLE2 /12/			
20856	10123136.754.069.423 0.00ns	K20.5	50		BC			
20857	10123136.754.069.426 3.33ns	D16.2	50		IDLE2 /12/			
20858	10123136.754.069.436 6.66ns	K20.5	50		BC			
20859	10123136.754.069.436 3.33ns	D16.2	50		IDLE2 /12/			
20860	10123136.754.069.436 0.00ns	K20.5	50		BC			
20861	10123136.754.069.439 3.33ns	D16.2	50		IDLE2 /12/			
20862	10123136.754.069.446 6.66ns	K20.5	50		BC			
20863	10123136.754.069.449 3.33ns	D16.2	50		IDLE2 /12/			
20864	10123136.754.069.449 0.00ns	K20.5	50		BC			
20865	10123136.754.069.453 3.33ns	D16.2	50		IDLE2 /12/			
20866	10123136.754.069.459 6.66ns	K20.5	50		BC			
20867	10123136.754.069.463 3.33ns	D16.2	50		IDLE2 /12/			
20868	10123136.754.069.463 0.00ns	K20.5	50		BC			
20869	10123136.754.069.463 3.33ns	D16.2	50		IDLE2 /12/			
20870	10123136.754.069.466 6.66ns	D16.2	55		BC			
20871	10123136.754.069.473 6.66ns	K20.5	55		BC			
20872	10123136.754.069.476 3.33ns	D16.2	55		IDLE2 /12/			
20873	10123136.754.069.476 0.00ns	K20.5	55		BC			
20874	10123136.754.069.479 3.33ns	D16.2	55		IDLE2 /12/			
20875	10123136.754.069.486 6.66ns	K20.5	55		BC			
20876	10123136.754.069.489 3.33ns	D16.2	55		IDLE2 /12/			
20877	10123136.754.069.489 0.00ns	K20.5	55		BC			
20878	10123136.754.069.493 3.33ns	D16.2	55		IDLE2 /12/			
20879	10123136.754.069.499 6.66ns	K20.5	55		BC			
20880	10123136.754.069.503 3.33ns	D16.2	55		IDLE2 /12/			
20881	10123136.754.069.503 0.00ns	K20.5	55		BC			
20882	10123136.754.069.506 3.33ns	D16.2	05		BC			
20883	10123136.754.069.513 6.66ns	K20.5	55		BC			
20884	10123136.754.069.516 3.33ns	D16.2	00		BC			
20885	10123136.754.069.516 0.00ns	D16.2	50		BC			
20886	10123136.754.069.519 3.33ns	D16.2	00		BC			
20887	10123136.754.069.526 6.66ns	K20.5	55		BC			

4. Use 32Gb RAM as the buffer to stream all Way Station data into the SSD/HDD.
5. “Data Filter” & “Idle Filter” filter unwanted data and idle to save memory.

**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. “Search” searches specific data.
7. “CRC Packet” displays and counts CRC
8. D-PHY command statistics include numbers of packets, individual command, different data length, and errors

The image displays two side-by-side screenshots of the Acute Navigator software interface, showing network statistics for different protocols.

**Left Screenshot: PCS Statistics**

Discription	Txns	Bytes
PCS		
Tx	38239	
Rx	40337	

Statistics	Txns	Bytes
Configuration /C/	0	
CFG_REG1 /C1/	0	
CFG_REG2 /C2/	0	
IDLE /I/	37846	
IDLE1 /I1/	62	
IDLE2 /I2/	37784	
LP /LI/	0	
LP11 /LI1/	0	
LP12 /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	

**Right Screenshot: GMII Statistics**

Discription	Txns	Bytes
GMII		
Errors	1	
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	Txns	Bytes
04-D4-C4-4A-42-9D		
Direction	90	
TX	0	
RX	90	

## 9. SGMII command trigger

- a. Trigger parameters include commands and data in order to cover all kinds of packets.
- b. GMII & PCS Packet
- c. Trigger CRC Error, Frame Error, Propagation Error, Start of Packet, End of Packet, Carrier Extend, Configuration.
- d. The Trigger-Out port is to trigger a DSO to capture waveforms

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

## 9. Advanced usage of the report area

a. Dual report correlation: PCS and GMII reports are related to each other.

Double-click to track the corresponding data in another report area.

ex: Click the PCS area report to link to the GMII corresponding report.

Timestamp (h:m:s.ms.us.nz)	Tx Code	Rx Code	Tx	Rx	Tx Set	Rx Set
10:23:36.754.077.652	D16.2		50			
10:23:36.754.077.658	K27.7		7B			
10:23:36.754.077.662	D21.2		55			
10:23:36.754.077.666	K28.5		BC		IDLE2 /I2/	
10:23:36.754.077.670	D16.2		50			
10:23:36.754.077.674	D21.2		55			
10:23:36.754.077.678	D21.2		55			
10:23:36.754.077.682	K28.5		BC		IDLE2 /I2/	
10:23:36.754.077.686	D16.2		50			
10:23:36.754.077.690	D21.2		55			
10:23:36.754.077.694	D21.2		55			
10:23:36.754.077.698	K28.5		BC		IDLE2 /I2/	
10:23:36.754.077.702	D16.2		50			
10:23:36.754.077.706	D21.2		55			
10:23:36.754.077.710	D21.2		55			
10:23:36.754.077.714	K28.5		BC		IDLE2 /I2/	
10:23:36.754.077.718	D16.2		50			
10:23:36.754.077.722	D4.6		C4			
10:23:36.754.077.726	D10.2		4A			
10:23:36.754.077.730	K28.5		BC		IDLE2 /I2/	
10:23:36.754.077.734	D16.2		50			
10:23:36.754.077.738	D2.2		42			
10:23:36.754.077.742	D29.4		9D			
10:23:36.754.077.746	K28.5		BC		IDLE2 /I2/	
10:23:36.754.077.750	D16.2		50			
10:23:36.754.077.754	D0.0		00			
10:23:36.754.077.758	D0.7		E0			
10:23:36.754.077.762	K28.5		BC		IDLE2 /I2/	
10:23:36.754.077.766	D16.2		50			
10:23:36.754.077.770	D12.2		4C			
10:23:36.754.077.774	D0.3		60			
10:23:36.754.077.778	K28.5		BC		IDLE2 /I2/	
10:23:36.754.077.782	D16.2		50			
10:23:36.754.077.786	D27.3		7B			
10:23:36.754.077.790	D2.4		82			
10:23:36.754.077.794	K28.5		BC		IDLE2 /I2/	

b. Statistics list: Quickly categorize and track the location of data with statistical functions.

File Capture Cursor

Connect Protocol Protocol Analyzer Hide Waveforms Run Search All Fields 3454 / 175983 To bottom Window Save to list Stack EXT 001

Timestamp (h:m:s.ms.us.nz) Tx Code Rx Code Tx Rx Tx Set Rx Set

Timestamp (h:m:s.ms.us.nz)	Tx Code	Rx Code	Tx	Rx	Tx Set	Rx Set
10:23:36.754.011.442	D18.1		33			
10:23:36.754.011.442	D18.2		52			
10:23:36.754.011.452	D19.1		33			
10:23:36.754.011.452	D9.2		49			
10:23:36.754.011.455	D19.1		33			
10:23:36.754.011.455	D7.2		47			
10:23:36.754.011.465	D28.5		B9			
10:23:36.754.011.468	D0.0		03			
10:23:36.754.011.468	D19.4		00			
10:23:36.754.011.478	D0.0		00			
10:23:36.754.011.478	D11.1		2B			
10:23:36.754.011.478	D0.0		00			
10:23:36.754.011.482	D13.7		ED			
10:23:36.754.011.482	D0.0		00			
10:23:36.754.011.492	K28.5		FD		EFD /I2/	
10:23:36.754.011.492	D0.0		00			
10:23:36.754.011.495	K23.7		F7		CAR_EXTEND /R/	
10:23:36.754.011.505	D28.5		B9			
10:23:36.754.011.505	D16.2		50			
10:23:36.754.011.505	K28.5		BC		IDLE2 /I2/	
10:23:36.754.011.508	D16.2		50			
10:23:36.754.011.508	D0.0		00			

Navigator

- PCS
  - Tx 38239
  - Rx 40337
- Statistics
  - Configuration /C/ 0
  - CFG\_RES2 /C2/ 0
  - CFG\_RES2 /C2/ 0
  - IDLE /I/ 37846
  - IDLE /I2/ 62
  - LP1 /L1/ 37784
  - LP1 /L1/ 0
  - LP2 /L2/ 0
  - Encapsulation 393
  - CAR\_EXTEND /R/ 131
  - SPD /S/ 131
  - ERR\_PROP /I/ 0
  - Disparity 0
  - Not in table 0

Search List [PCS] Toggle List Statistics List Bookmark List [PCS] Search List [GMII] Bookmark List [GMII]

Line No. Timestamp (h:m:s.ms.us.nz) Tx Code Rx Code Tx Rx Tx Set Rx Set Information

Line No.	Timestamp (h:m:s.ms.us.nz)	Tx Code	Rx Code	Tx	Rx	Tx Set	Rx Set	Information
1039	0.000.003.456	K23.7		F7		CAR_EXTEND /R/		
2120	0.000.007.055	K23.7		F7		CAR_EXTEND /R/		
3454	0.000.011.495	K23.7		F7		CAR_EXTEND /R/		
1948	0.000.016.535	K23.7		F7		CAR_EXTEND /R/		
6165	0.000.020.521	K23.7		F7		CAR_EXTEND /R/		
7603	0.000.025.307	K23.7		F7		CAR_EXTEND /R/		
9059	0.000.030.253	K23.7		F7		CAR_EXTEND /R/		
10287	0.000.034.239	K23.7		F7		CAR_EXTEND /R/		
11719	0.000.039.233	K23.7		F7		CAR_EXTEND /R/		
12774	0.000.042.519	K23.7		F7		CAR_EXTEND /R/		
14664	0.000.048.145	K23.7		F7		CAR_EXTEND /R/		
15638	0.000.052.718	K23.7		F7		CAR_EXTEND /R/		

## 10. SGMII settings



1. **SGMII way station settings:** Exchange p, n of the same Lane,
2. **Startup Settings:** It needs to be set the mode of the ethernet packet speed at the moment of capturing data.
3. **Trigger On:** Can set GMII/PCS packets, CRC Error, Frame Error, Propagation Error, Start of Packet, End of Packet, Carrier Extend, Configuration, Disparity Error, Configuration, Not in Table trigger settings.
4. **Filter:** After opening Data Filter or Idle Filter, Data Filter will filter out the data behind the packet greater than the set value and Idle Filter will filter out the Idle packet to save memory while recording.



## FAQ

### 1. What SGMII speed is supported, any limitation for differential ports?

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

### 2. Will the signal quality be affected during measurement?

A: The measurement of the external instrument will inevitably have some load effect. We use the SMPM Coaxial Cable connection to reduce the interference of the object to be measured and improve the signal quality.

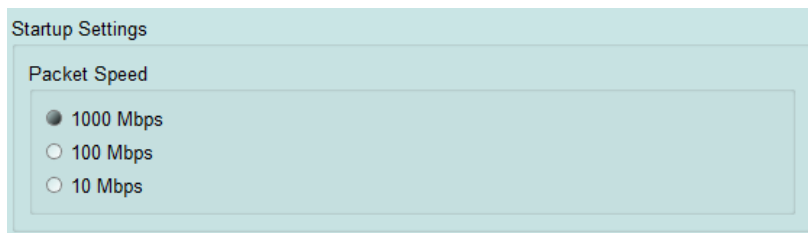
### 3. Is Tx supported?

A: No

### 4. Precautions during measurement

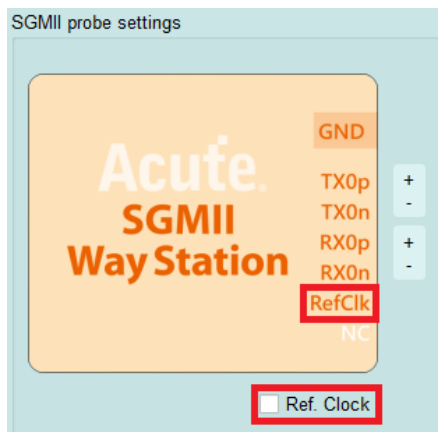
#### a. Startup Settings:

SGMII supports different packet speeds. If the initial speed is not set correctly, the data volume will be 10 times or 100 times, which will make the analysis result abnormal. Besides, if a Speed Config packet appears during the capture process, the Config packet will be used as the new packet sending speed.



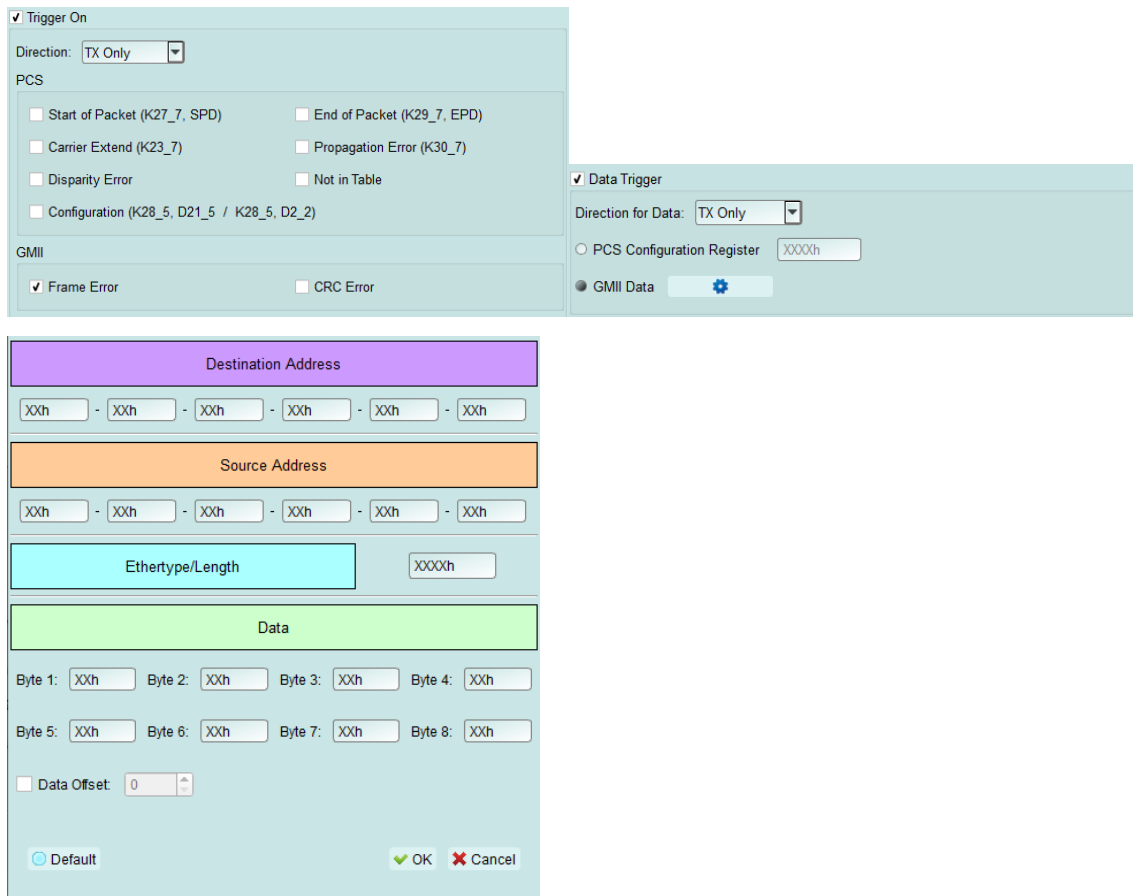
#### b. Reference clock setting method:

Since SGMII signals are 8b/10b encoding, it can be analyzed normally without connecting the Reference clock during measurement. Ref. clock can also provide by external signal. You can access the Ref Clk port from the SGMII Way Station below, and select Ref. Clock.



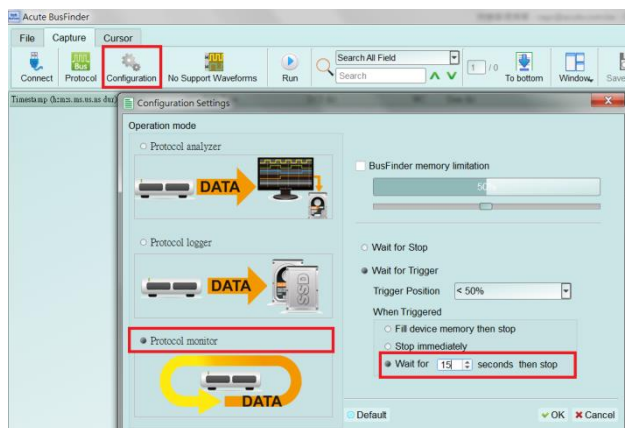
### 5. Can I specify a PCS, GMII packet as the trigger point function?

A: You can specify specific PCS, GMII packet or Error to trigger.



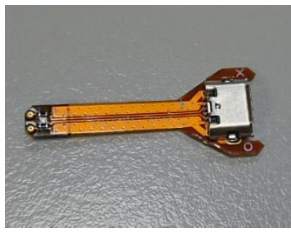
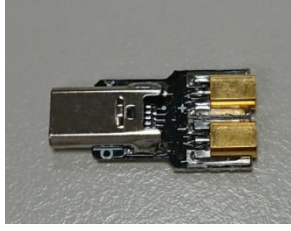
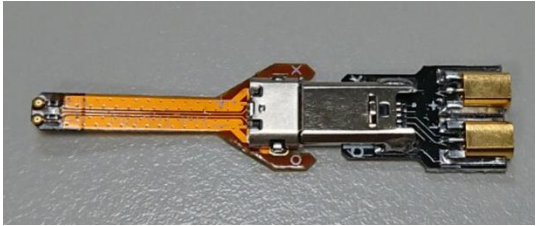
**6. Is it possible to set a PCS, GMII starting point, and specify how much time to capture Data?**

A: You can set the starting condition to the trigger item and adjust to the data monitor mode in the working mode menu. And specify the length of acquisition time.



## Probe and test object connection

With **End-Tip connection**:

Components		
End-tip (FPC)		Combined
End-Tip Connector(FPC)		
		

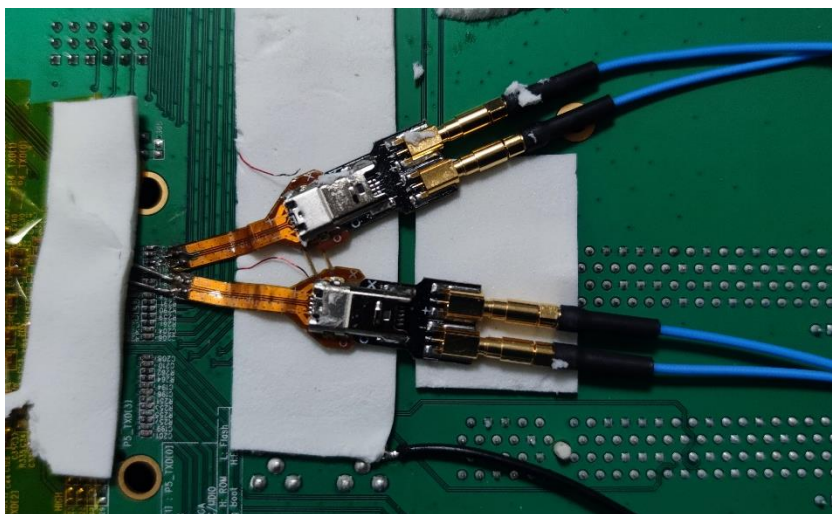
The resistance on the end-tip(FPC) is 250ohm ◦

## Pin connection

For SGMII way station USB3.0 connection, please plug in the bottom one.



End-tip Connection:



## Way Station connection

