



# **BF7264 Series Protocol Analyzer SGMII Solution**

## Index

Feature:.....	2
FAQ.....	10
BusFinder and Probe connection.....	12
Probe and test object connection.....	14
Pin connection.....	14
Way Station connection.....	15

## Feature:

Supported Models:

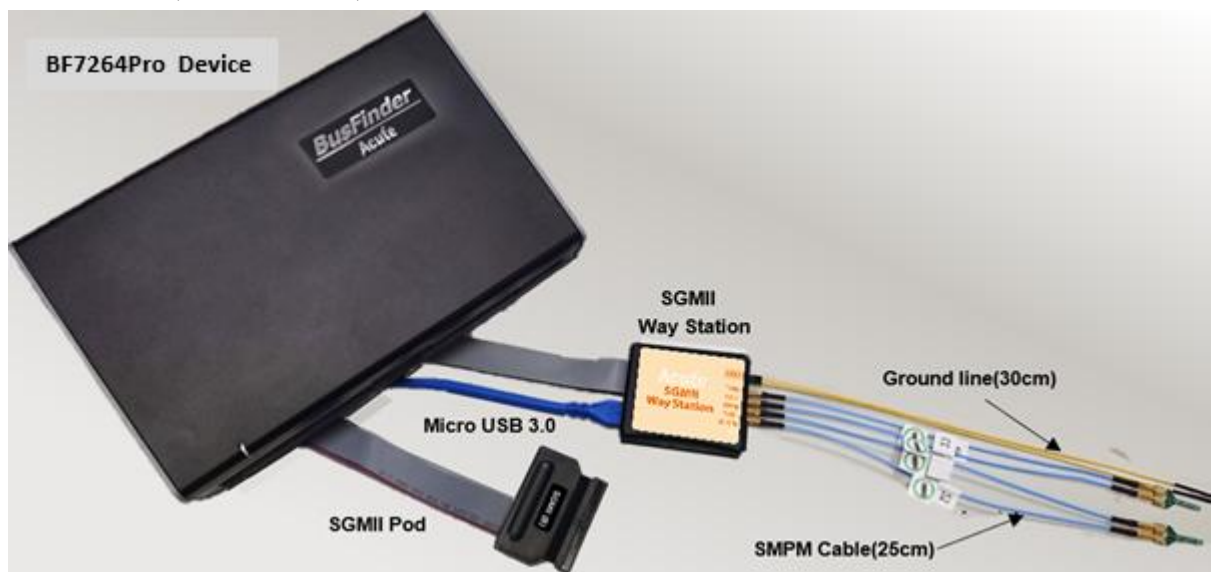
BF6264B	BF7264B	BF7264B+	BF7264 Pro
	●	●	●

**BF7264B/B+/Pro has two USB holes at the front.**

In addition to the host can continue to use the predecessor, BF6264B, functions, the newly added SGMII analyzer function.

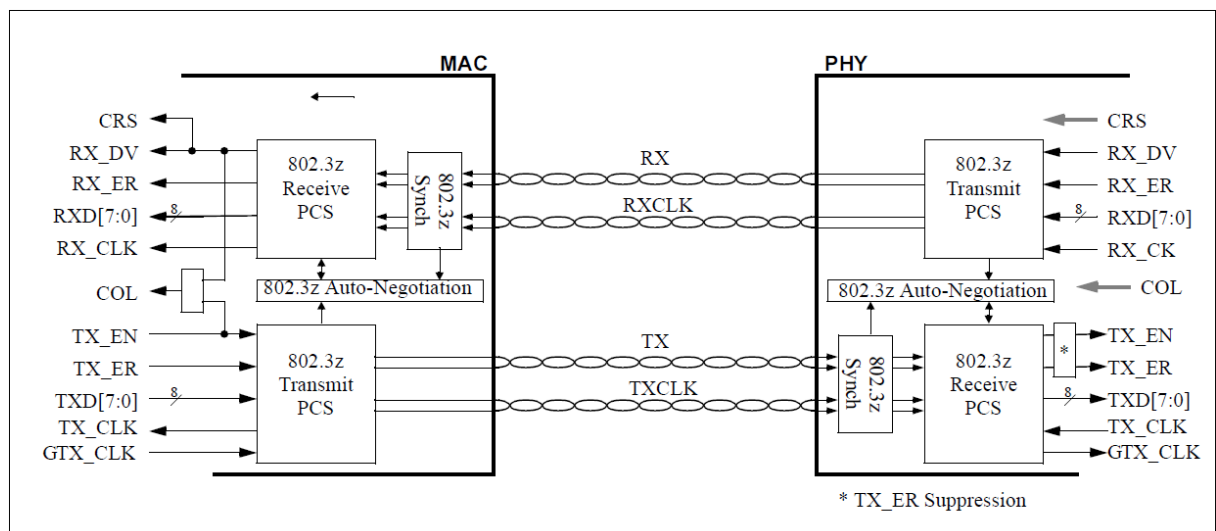
Specifications:

### 1. BF7264Pro, 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	Tx Set	Rx Set
20047	10123136.754.069.396 3.33ns	D16.2	SO		
20048	10123136.754.069.396 0.00ns	R20.5	BC	IDLE2 /12/	
20049	10123136.754.069.399 3.33ns	D16.2	SO		
20050	10123136.754.069.406 6.66ns	R20.5	BC	IDLE2 /12/	
20051	10123136.754.069.409 3.33ns	D16.2	SO		
20052	10123136.754.069.409 0.00ns	R20.5	BC	IDLE2 /12/	
20053	10123136.754.069.413 3.33ns	D16.2	SO		
20054	10123136.754.069.419 6.66ns	R20.5	BC	IDLE2 /12/	
20055	10123136.754.069.423 3.33ns	D16.2	SO		
20056	10123136.754.069.423 0.00ns	R20.5	BC	IDLE2 /12/	
20057	10123136.754.069.426 3.33ns	D16.2	SO		
20058	10123136.754.069.433 6.66ns	R20.5	BC	IDLE2 /12/	
20059	10123136.754.069.436 3.33ns	D16.2	SO		
20060	10123136.754.069.436 0.00ns	R20.5	BC	IDLE2 /12/	
20061	10123136.754.069.439 3.33ns	D16.2	SO		
20062	10123136.754.069.446 6.66ns	R20.5	BC	IDLE2 /12/	
20063	10123136.754.069.449 3.33ns	D16.2	SO		
20064	10123136.754.069.449 0.00ns	R20.5	BC	IDLE2 /12/	
20065	10123136.754.069.453 3.33ns	D16.2	SO		
20066	10123136.754.069.459 6.66ns	R20.5	BC	IDLE2 /12/	
20067	10123136.754.069.463 3.33ns	D16.2	SO		
20068	10123136.754.069.463 0.00ns	R20.5	BC	IDLE2 /12/	
20069	10123136.754.069.463 3.33ns	D16.2	SO		
20070	10123136.754.069.466 3.33ns	D16.2	SO		
20071	10123136.754.069.473 6.66ns	R20.5	BC	IDLE2 /12/	
20072	10123136.754.069.476 3.33ns	D16.2	SO		
20073	10123136.754.069.476 0.00ns	R20.5	BC	IDLE2 /12/	
20074	10123136.754.069.479 3.33ns	D16.2	SO		
20075	10123136.754.069.486 6.66ns	R20.5	BC	IDLE2 /12/	
20076	10123136.754.069.489 3.33ns	D16.2	SO		
20077	10123136.754.069.489 0.00ns	R20.5	BC	IDLE2 /12/	
20078	10123136.754.069.493 3.33ns	D16.2	SO		
20079	10123136.754.069.499 6.66ns	R20.5	BC	IDLE2 /12/	
20080	10123136.754.069.503 3.33ns	D16.2	SO		
20081	10123136.754.069.503 0.00ns	R20.5	BC	IDLE2 /12/	
20082	10123136.754.069.506 3.33ns	D16.2	SO		
20083	10123136.754.069.513 6.66ns	R20.5	BC	IDLE2 /12/	
20084	10123136.754.069.516 3.33ns	D16.2	SO		
20085	10123136.754.069.516 0.00ns	R20.5	BC	IDLE2 /12/	
20086	10123136.754.069.519 3.33ns	D16.2	SO		
20087	10123136.754.069.526 6.66ns	R20.5	BC	IDLE2 /12/	

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. 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**

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	

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: TX Only ▼

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

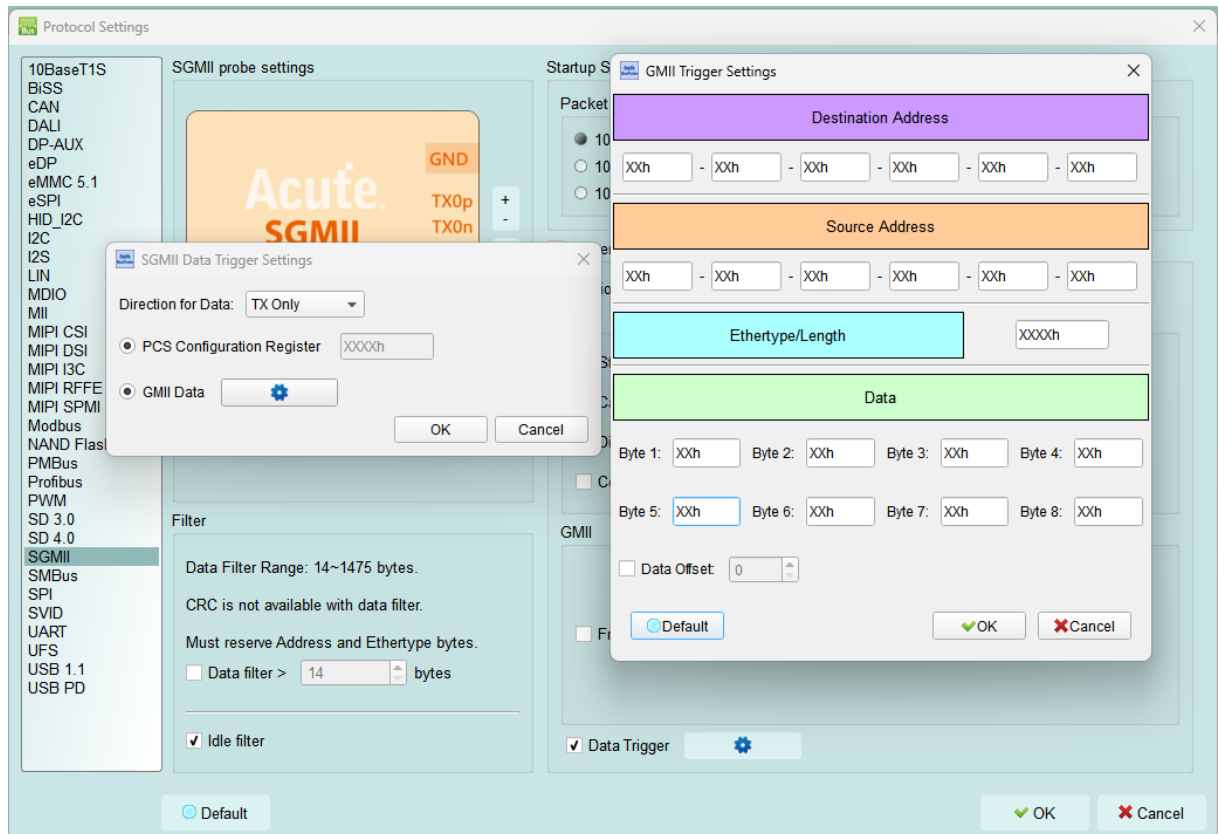
☐ Configuration (K28\_5, D21\_5 / K28\_5, D2\_2)

GMII

☐ Frame Error

☐ CRC Error

☒ Data Trigger 



## 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.ns dur)	Tx Code	Rx Code	Tx 'Tx Set	Rx Set
10:23:36.754.077.652 3.33ms	D16.2		50	
10:23:36.754.077.658 6.66ms				
10:23:36.754.077.658 0.00ms	K22.7	7B		SPD / 84
10:23:36.754.077.662 3.33ms	D21.2	55		
10:23:36.754.077.664 0.00ms	D21.2	55		
10:23:36.754.077.665 3.33ms	D16.2		50	
10:23:36.754.077.672 6.66ms	D21.2	55		
10:23:36.754.077.675 3.33ms	D21.2	55		
10:23:36.754.077.675 3.33ms	K28.5	BC		IDLE2 / I2/
10:23:36.754.077.678 3.33ms	D16.2		50	
10:23:36.754.077.685 6.66ms	D21.2	55		
10:23:36.754.077.688 3.33ms	D21.2	55		
10:23:36.754.077.688 3.00ms	K28.5	BC		IDLE2 / I2/
10:23:36.754.077.692 3.33ms	D16.2		50	
10:23:36.754.077.698 6.66ms	D21.2	55		
10:23:36.754.077.702 3.33ms	D21.6	D5		
10:23:36.754.077.702 3.33ms	K28.5	BC		IDLE2 / I2/
10:23:36.754.077.712 6.66ms	D16.2		50	
10:23:36.754.077.712 6.66ms	D4.0	04		
10:23:36.754.077.715 3.33ms	D20.6	D4		
10:23:36.754.077.715 0.00ms	K28.5	BC		IDLE2 / I2/
10:23:36.754.077.718 3.33ms	D16.2		50	
10:23:36.754.077.725 6.66ms	D4.6	C4		
10:23:36.754.077.728 3.33ms	D10.2	4A		
10:23:36.754.077.728 0.00ms	K28.5	BC		IDLE2 / I2/
10:23:36.754.077.732 3.33ms	D16.2		50	
10:23:36.754.077.738 6.66ms	D2.2	42		
10:23:36.754.077.742 3.33ms	D29.4	9D		
10:23:36.754.077.742 0.00ms	K28.5	BC		IDLE2 / I2/
10:23:36.754.077.745 3.33ms	D16.2		50	
10:23:36.754.077.752 6.66ms	D0.0	00		
10:23:36.754.077.755 3.33ms	D0.7	E0		
10:23:36.754.077.758 3.33ms	K28.5	BC		IDLE2 / I2/
10:23:36.754.077.758 3.33ms	D16.2		50	
10:23:36.754.077.765 6.66ms	D12.2	4C		
10:23:36.754.077.768 3.33ms	D0.3	60		
10:23:36.754.077.768 0.00ms	K28.5	BC		IDLE2 / I2/
10:23:36.754.077.772 3.33ms	D16.2		50	
10:23:36.754.077.776 6.66ms	D27.3	7B		
10:23:36.754.077.782 3.33ms	D2.4	82		
10:23:36.754.077.782 0.00ms	K28.5	BC		IDLE2 / I2/

Timestamp (h:m:s.ms.us.ns dur)	Dir	Destination Address	Source Address	EtherType	Data
10:23:36.754.041.919 3.27ms	TX	00-E0-4C-60-7B-82	04-D4-C4-4A-42-9D	0800	45 00 C
10:23:36.754.044.385 2.46ms	RX	04-D4-C4-4A-42-9D	00-E0-4C-60-7B-82	0800	45 00 C
10:23:36.754.047.945 3.15ms	TX	00-E0-4C-60-7B-82	04-D4-C4-4A-42-9D	0800	45 00 C
10:23:36.754.050.359 2.81ms	RX	04-D4-C4-4A-42-9D	00-E0-4C-60-7B-82	0800	45 00 C
10:23:36.754.052.118 1.75ms	TX	00-E0-4C-60-7B-82	04-D4-C4-4A-42-9D	0800	45 00 C
10:23:36.754.055.477 3.35ms	RX	04-D4-C4-4A-42-9D	00-E0-4C-60-7B-82	0800	45 00 C
10:23:36.754.056.517 1.03ms	TX	00-E0-4C-60-7B-82	04-D4-C4-4A-42-9D	0800	45 00 C
10:23:36.754.061.400 4.88ms	TX	00-E0-4C-60-7B-82	04-D4-C4-4A-42-9D	0800	45 00 C
10:23:36.754.065.066 3.66ms	TX	00-E0-4C-60-7B-82	04-D4-C4-4A-42-9D	0800	45 00 C
10:23:36.754.066.570 1.50ms	RX	04-D4-C4-4A-42-9D	00-E0-4C-60-7B-82	0800	45 00 C
10:23:36.754.069.466 2.39ms	TX	00-E0-4C-60-7B-82	04-D4-C4-4A-42-9D	0800	45 00 C
10:23:36.754.072.542 3.07ms	RX	04-D4-C4-4A-42-9D	00-E0-4C-60-7B-82	0800	45 00 C
10:23:36.754.074.399 1.85ms	TX	00-E0-4C-60-7B-82	04-D4-C4-4A-42-9D	0800	45 00 C
10:23:36.754.077.662 3.26ms	RX	04-D4-C4-4A-42-9D	00-E0-4C-60-7B-82	0800	45 00 C
10:23:36.754.078.395 743.2	TX	00-E0-4C-60-7B-82	04-D4-C4-4A-42-9D	0800	45 00 C
10:23:36.754.083.634 5.24ms	RX	04-D4-C4-4A-42-9D	00-E0-4C-60-7B-82	0800	45 00 C
10:23:36.754.087.704 4.06ms	TX	00-E0-4C-60-7B-82	04-D4-C4-4A-42-9D	0800	45 00 C
10:23:36.754.088.754 1.04ms	RX	04-D4-C4-4A-42-9D	00-E0-4C-60-7B-82	0800	45 00 C
10:23:36.754.091.477 2.72ms	TX	00-E0-4C-60-7B-82	04-D4-C4-4A-42-9D	0800	45 00 C
10:23:36.754.094.727 3.24ms	RX	04-D4-C4-4A-42-9D	00-E0-4C-60-7B-82	0800	45 00 C
10:23:36.754.096.357 1.62ms	TX	00-E0-4C-60-7B-82	04-D4-C4-4A-42-9D	0800	45 00 C
10:23:36.754.100.876 4.51ms	TX	00-E0-4C-60-7B-82	04-D4-C4-4A-42-9D	0800	45 00 C
10:23:36.754.104.982 4.10ms	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 3.93ms	TX	00-E0-4C-60-7B-82	04-D4-C4-4A-42-9D	0800	45 00 C
10:23:36.754.111.792 2.03ms	RX	04-D4-C4-4A-42-9D	00-E0-4C-60-7B-82	0800	45 00 C
10:23:36.754.114.528 2.73ms	TX	00-E0-4C-60-7B-82	04-D4-C4-4A-42-9D	0800	45 00 C
10:23:36.754.116.911 2.38ms	RX	04-D4-C4-4A-42-9D	00-E0-4C-60-7B-82	0800	45 00 C
10:23:36.754.118.101 1.18ms	TX	00-E0-4C-60-7B-82	04-D4-C4-4A-42-9D	0800	45 00 C
10:23:36.754.123.301 5.19ms	TX	00-E0-4C-60-7B-82	04-D4-C4-4A-42-9D	0800	45 00 C
10:23:36.754.126.887 3.58ms	TX	00-E0-4C-60-7B-82	04-D4-C4-4A-42-9D	0800	45 00 C
10:23:36.754.128.003 1.11ms	RX	04-D4-C4-4A-42-9D	00-E0-4C-60-7B-82	0800	45 00 C
10:23:36.754.132.006 4.00ms	TX	00-E0-4C-60-7B-82	04-D4-C4-4A-42-9D	0800	45 00 C
10:23:36.754.133.976 1.96ms	RX	04-D4-C4-4A-42-9D	00-E0-4C-60-7B-82	0800	45 00 C
10:23:36.754.135.593 1.61ms	TX	00-E0-4C-60-7B-82	04-D4-C4-4A-42-9D	0800	45 00 C
10:23:36.754.140.139 4.54ms	TX	00-E0-4C-60-7B-82	04-D4-C4-4A-42-9D	0800	45 00 C
10:23:36.754.145.068 4.92ms	RX	04-D4-C4-4A-42-9D	00-E0-4C-60-7B-82	0800	45 00 C
10:23:36.754.149.098 4.02ms	TX	00-E0-4C-60-7B-82	04-D4-C4-4A-42-9D	0800	45 00 C
10:23:36.754.151.041 1.94ms	RX	04-D4-C4-4A-42-9D	00-E0-4C-60-7B-82	0800	45 00 C
10:23:36.754.153.991 2.94ms	TX	00-E0-4C-60-7B-82	04-D4-C4-4A-42-9D	0800	45 00 C
10:23:36.754.156.161 2.16ms	RX	04-D4-C4-4A-42-9D	00-E0-4C-60-7B-82	0800	45 00 C



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

The screenshot shows the Acute software interface with a packet capture list and a statistics list. The statistics list is highlighted with a red box, and a red arrow points to the 'CAR\_EXTEND /R/' entry. The statistics list shows various categories such as Configuration, IDLE, LP1, LP2, CAR\_EXTEND, SPD, EPD, ERR\_PROP, and Disparity, with their respective counts and bytes.

## 10. SGMII settings

The SGMII probe settings dialog box is shown. It includes sections for Startup Settings, Filter, and SGMII. The Startup Settings section includes Packet Speed (1000 Mbps), Trigger On (TX Only), and Direction (TX Only). The Filter section includes Data Filter Range (14~1475 bytes) and CRC settings. The SGMII section includes Frame Error and CRC Error checkboxes.

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. **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.ss
4. **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.

## 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:

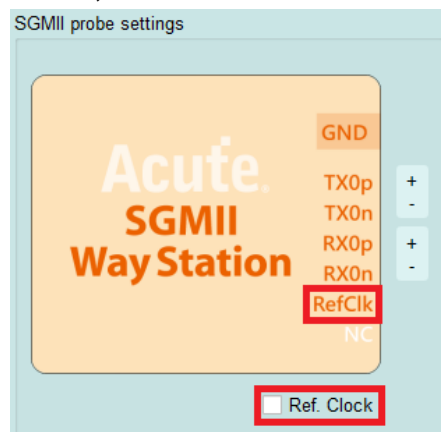
SGMII supports different packet speeds. If the initial speed is not set correctly, the data volume will be 10 times or 100 times, which will make the analysis result abnormal. Besides, if a Speed Config packet appears during the capture process, the Config packet will be used as the new packet sending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

**Trigger On**

Direction: TX Only

**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

**SGMII Data Trigger Settings**

Direction for Data: TX Only

☐ PCS Configuration Register: XXXXh

☒ GMII Data

OK Cancel

**Destination Address**

XXh - XXh - XXh - XXh - XXh - XXh

**Source Address**

XXh - XXh - XXh - XXh - XXh - XXh

**Ethertype/Length**

XXXXh

**Data**

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

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

☐ Data Offset: 0

Default OK Cancel

## 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.

**Acute BusFinder**

File Capture Cursor

Connect Protocol Configuration No Support Waveforms Run Search All Field Search 1/0 To bottom Window Save

**Configuration Settings**

**Operation mode**

- ☐ Protocol analyzer
- ☐ Protocol logger
- ☒ Protocol monitor

**BusFinder memory limitation**

☐ Wait for Stop

☒ Wait for Trigger

Trigger Position: < 50%

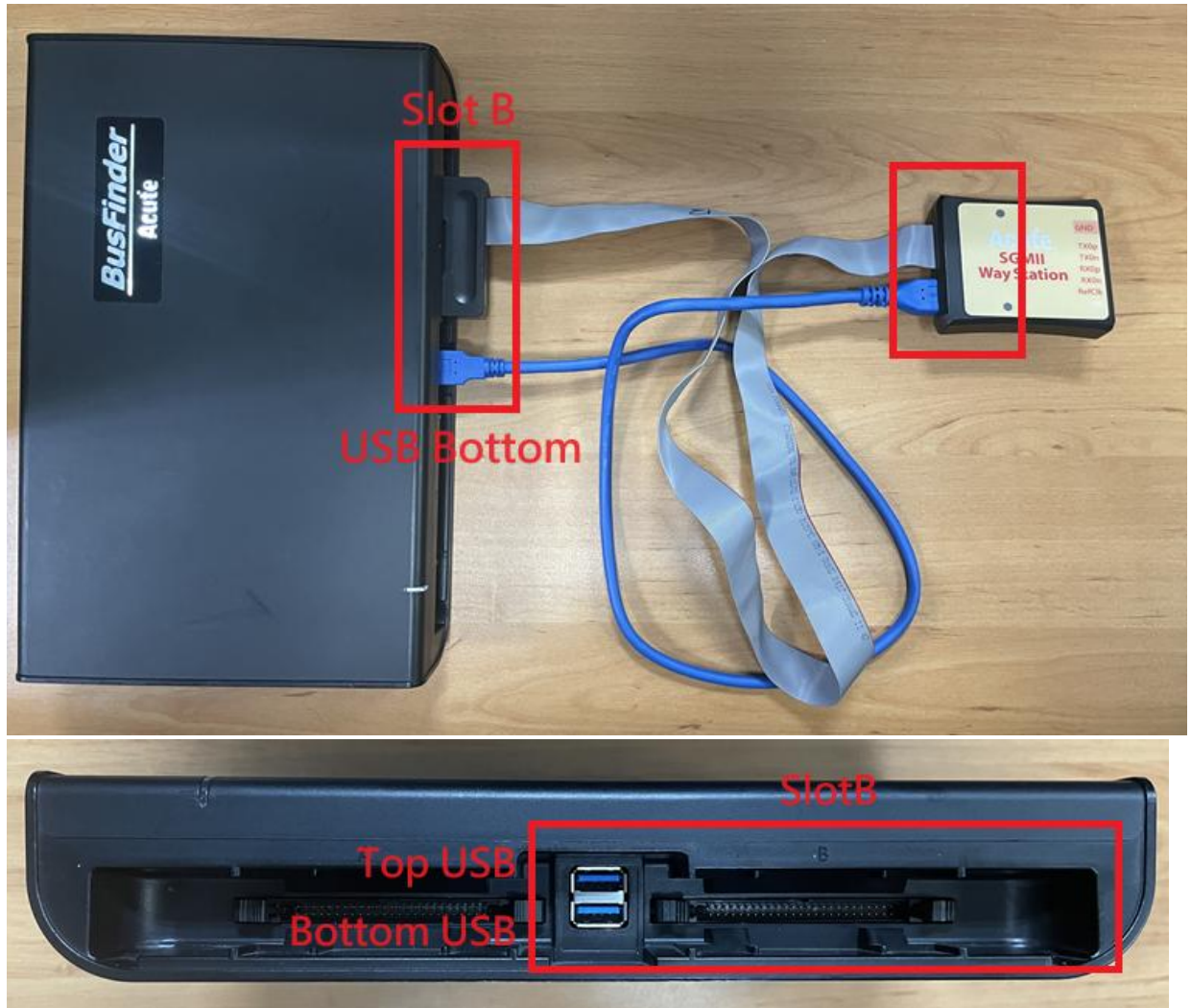
**When Triggered**

- ☐ Fill device memory then stop
- ☐ Stop immediately
- ☒ Wait for 15 seconds then stop

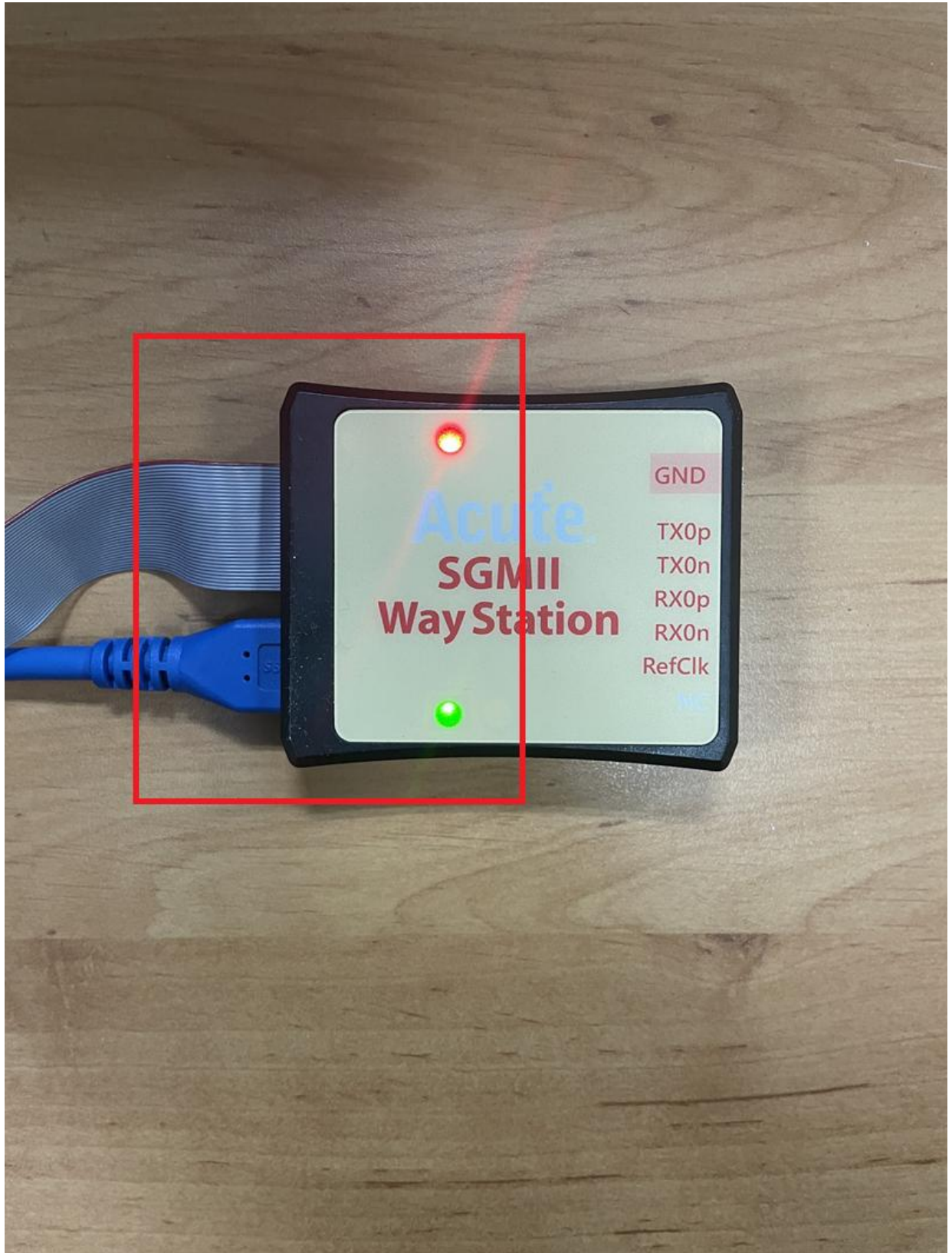
Default OK Cancel

## BusFinder and Probe connection

The BusFinder can only use Slot B as the probe connection slot, and note that the lower USB slot on the front of the host also needs to be connected to the Way Station. After connecting, please pay attention to whether the Way Station lights are both red and green.

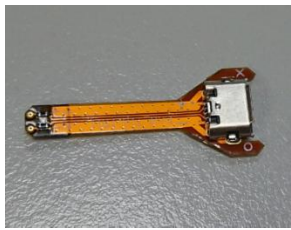
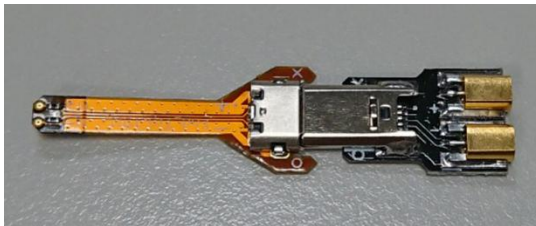
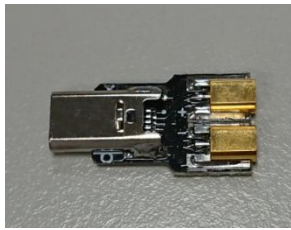






## Probe and test object connection

With End-Tip connection:

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

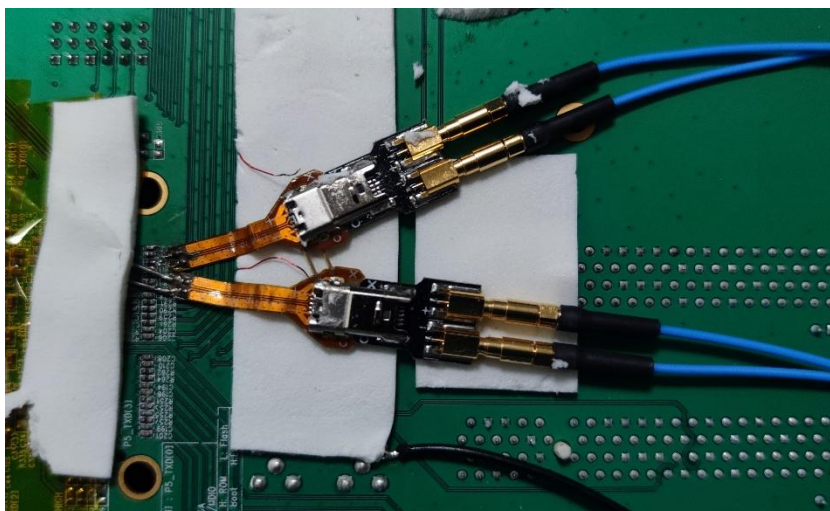
The resistance on the end-tip(FPC) is 250ohm .

## Pin connection

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



End-tip Connection:



## Way Station connection

