Acute®
PC-based T&M Instruments

BF7264 Series
SD 3.0 / SD 4.0 / SDIO 3.0
analyzer

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Feature

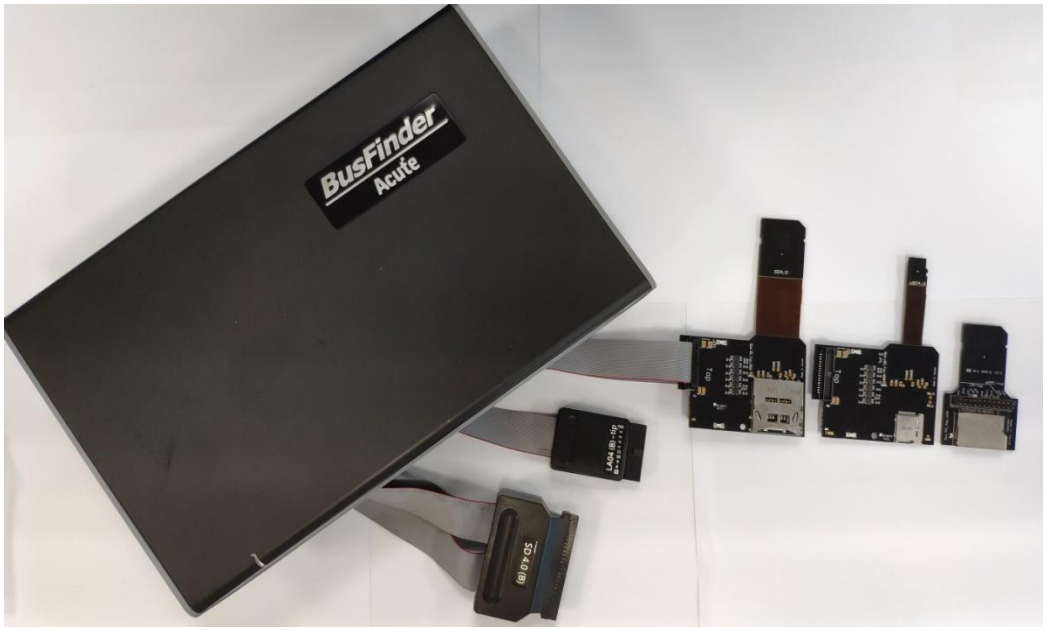
Supported Models:

BF6264B	BF7264B	BF7264B+	BF7264 Pro
●	●	●	●

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

BF7264B/B+/Pro, 32Gb RAM

1. **With SD 4.0 / SD 3.0 probe, SD3.0 signal can be measured.**



2. **With SD 4.0 probe, SD4.0 signal can be measured.**

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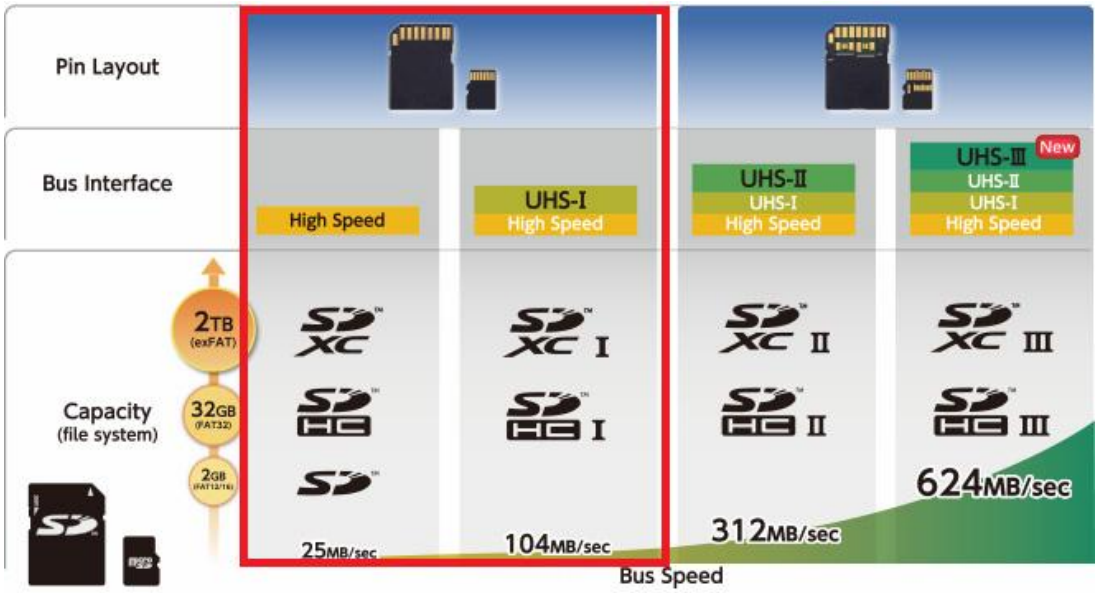
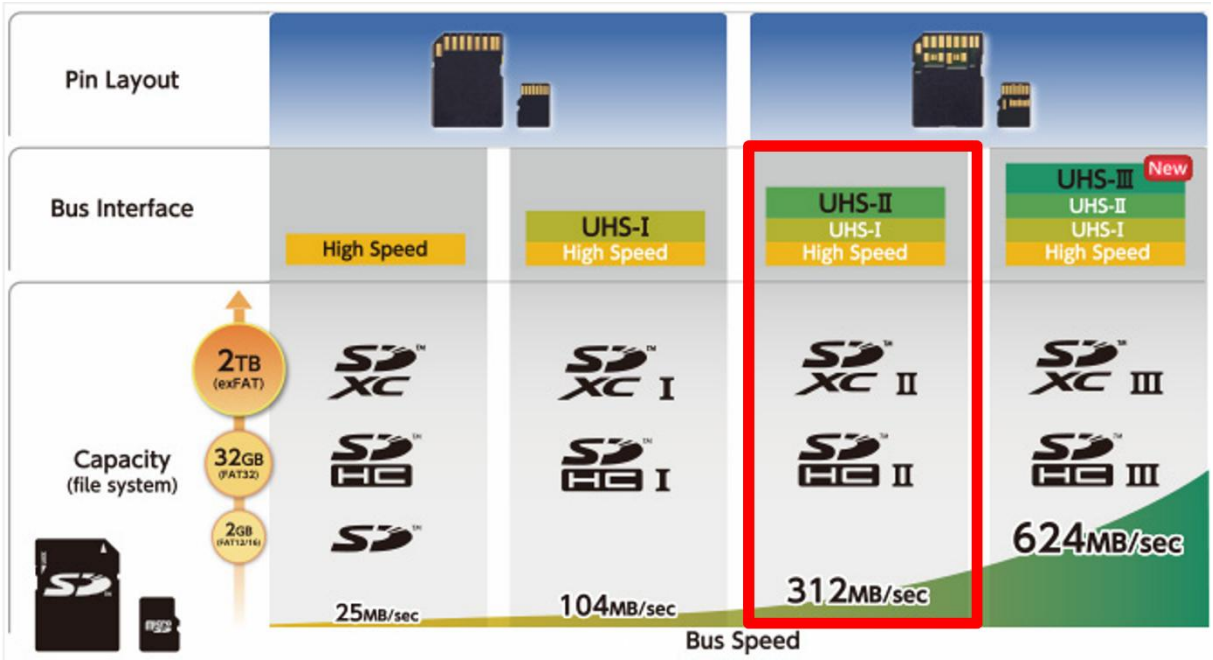
SD 3.0 solution supports SD 3.0 SDR104 / SD6.0 Legacy mode SDR104, DDR200/ SDIO 3.0 signal measurement.



SD4.0 solution supports SD 4.0 signal measurement.



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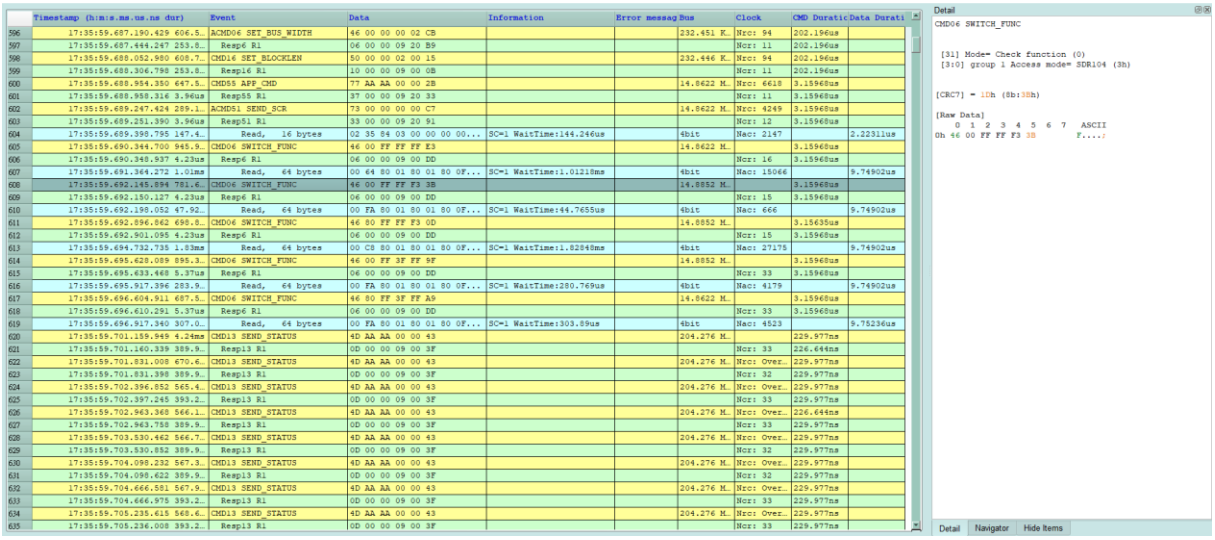
I. Can display SD 3.0 / SD 4.0 protocol packet data in tabular form, including command parsing

SD 3.0



	Timestamp (h:m:s.ms.us.ns dur)	Event	Data	Information	Error messag	Bus	Clock	CMD Duratic	Data Durati
596	17:35:59.687.190.429 606.5...	ACMD06 SET_BUS_WIDTH	46 00 00 00 02 CB			232.451 K...	Ncr: 94	202.196us	
597	17:35:59.687.444.247 253.8...	Resp6 R1	06 00 00 09 20 B9				Ncr: 11	202.196us	
598	17:35:59.688.052.980 608.7...	CMD16 SET_BLOCKLEN	50 00 00 02 00 15			232.446 K...	Ncr: 94	202.196us	
599	17:35:59.688.306.798 253.8...	Resp16 R1	10 00 00 09 00 0B				Ncr: 11	202.196us	
600	17:35:59.688.954.350 647.5...	CMD55 APP_CMD	77 AA AA 00 00 2B			14.8622 M...	Ncr: 6618	3.15968us	
601	17:35:59.688.958.316 3.96us	Resp55 R1	37 00 00 09 20 33				Ncr: 11	3.15968us	
602	17:35:59.689.247.424 289.1...	ACMD51 SEND_SCR	73 00 00 00 00 C7			14.8622 M...	Ncr: 4249	3.15968us	
603	17:35:59.689.251.390 3.96us	Resp51 R1	33 00 00 09 20 91				Ncr: 12	3.15968us	
604	17:35:59.689.390.795 147.4...	Read, 16 bytes	02 35 84 03 00 00 00 00...	SC=1 WaitTime:144.246us		4bit	Nac: 2147		2.22311us
605	17:35:59.690.344.700 945.9...	CMD06 SWITCH_FUNC	46 00 FF FF FF E3			14.8622 M...		3.15968us	
606	17:35:59.690.348.937 4.23us	Resp6 R1	06 00 00 09 00 DD				Ncr: 16	3.15968us	
607	17:35:59.691.364.272 1.01ms	Read, 64 bytes	00 64 80 01 80 01 80 0F...	SC=1 WaitTime:1.01218ms		4bit	Nac: 15066		9.74902us
608	17:35:59.692.145.894 781.6...	CMD06 SWITCH_FUNC	46 00 FF FF F3 3B			14.8852 M...		3.15968us	
609	17:35:59.692.150.127 4.23us	Resp6 R1	06 00 00 09 00 DD				Ncr: 15	3.15968us	
610	17:35:59.692.198.052 47.92...	Read, 64 bytes	00 FA 80 01 80 01 80 0F...	SC=1 WaitTime:44.7655us		4bit	Nac: 666		9.74902us
611	17:35:59.692.896.862 698.8...	CMD06 SWITCH_FUNC	46 80 FF FF F3 0D			14.8852 M...		3.15635us	
612	17:35:59.692.901.095 4.23us	Resp6 R1	06 00 00 09 00 DD				Ncr: 15	3.15968us	
613	17:35:59.694.732.735 1.83ms	Read, 64 bytes	00 C8 80 01 80 01 80 0F...	SC=1 WaitTime:1.82848ms		4bit	Nac: 27175		9.74902us
614	17:35:59.695.628.089 895.3...	CMD06 SWITCH_FUNC	46 00 FF 3F FF 9F			14.8852 M...		3.15968us	
615	17:35:59.695.633.468 5.37us	Resp6 R1	06 00 00 09 00 DD				Ncr: 33	3.15968us	
616	17:35:59.695.917.396 283.9...	Read, 64 bytes	00 FA 80 01 80 01 80 0F...	SC=1 WaitTime:280.769us		4bit	Nac: 4179		9.74902us
617	17:35:59.696.604.911 687.5...	CMD06 SWITCH_FUNC	46 80 FF 3F FF A9			14.8622 M...		3.15968us	
618	17:35:59.696.610.291 5.37us	Resp6 R1	06 00 00 09 00 DD				Ncr: 33	3.15968us	
619	17:35:59.696.917.340 307.0...	Read, 64 bytes	00 FA 80 01 80 01 80 0F...	SC=1 WaitTime:303.89us		4bit	Nac: 4523		9.75236us
620	17:35:59.701.159.949 4.24ms	CMD13 SEND_STATUS	4D AA AA 00 00 43			204.276 M...		229.977ns	
621	17:35:59.701.160.339 389.9...	Resp13 R1	0D 00 00 09 00 3F				Ncr: 33	226.644ns	
622	17:35:59.701.831.008 670.6...	CMD13 SEND_STATUS	4D AA AA 00 00 43			204.276 M...	Ncr: Over...	229.977ns	
623	17:35:59.701.831.398 389.9...	Resp13 R1	0D 00 00 09 00 3F				Ncr: 32	229.977ns	
624	17:35:59.702.396.852 565.4...	CMD13 SEND_STATUS	4D AA AA 00 00 43			204.276 M...	Ncr: Over...	229.977ns	
625	17:35:59.702.397.245 393.2...	Resp13 R1	0D 00 00 09 00 3F				Ncr: 33	229.977ns	
626	17:35:59.702.963.368 566.1...	CMD13 SEND_STATUS	4D AA AA 00 00 43			204.276 M...	Ncr: Over...	226.644ns	
627	17:35:59.702.963.758 389.9...	Resp13 R1	0D 00 00 09 00 3F				Ncr: 33	229.977ns	
628	17:35:59.703.530.462 566.7...	CMD13 SEND_STATUS	4D AA AA 00 00 43			204.276 M...	Ncr: Over...	229.977ns	
629	17:35:59.703.530.852 389.9...	Resp13 R1	0D 00 00 09 00 3F				Ncr: 32	229.977ns	
630	17:35:59.704.098.232 567.3...	CMD13 SEND_STATUS	4D AA AA 00 00 43			204.276 M...	Ncr: Over...	229.977ns	
631	17:35:59.704.098.622 389.9...	Resp13 R1	0D 00 00 09 00 3F				Ncr: 32	229.977ns	
632	17:35:59.704.666.581 567.9...	CMD13 SEND_STATUS	4D AA AA 00 00 43			204.276 M...	Ncr: Over...	229.977ns	
633	17:35:59.704.666.975 393.2...	Resp13 R1	0D 00 00 09 00 3F				Ncr: 33	229.977ns	
634	17:35:59.705.235.615 568.6...	CMD13 SEND_STATUS	4D AA AA 00 00 43			204.276 M...	Ncr: Over...	229.977ns	
635	17:35:59.705.236.008 393.2...	Resp13 R1	0D 00 00 09 00 3F				Ncr: 33	229.977ns	

Detail
CMD06 SWITCH_FUNC

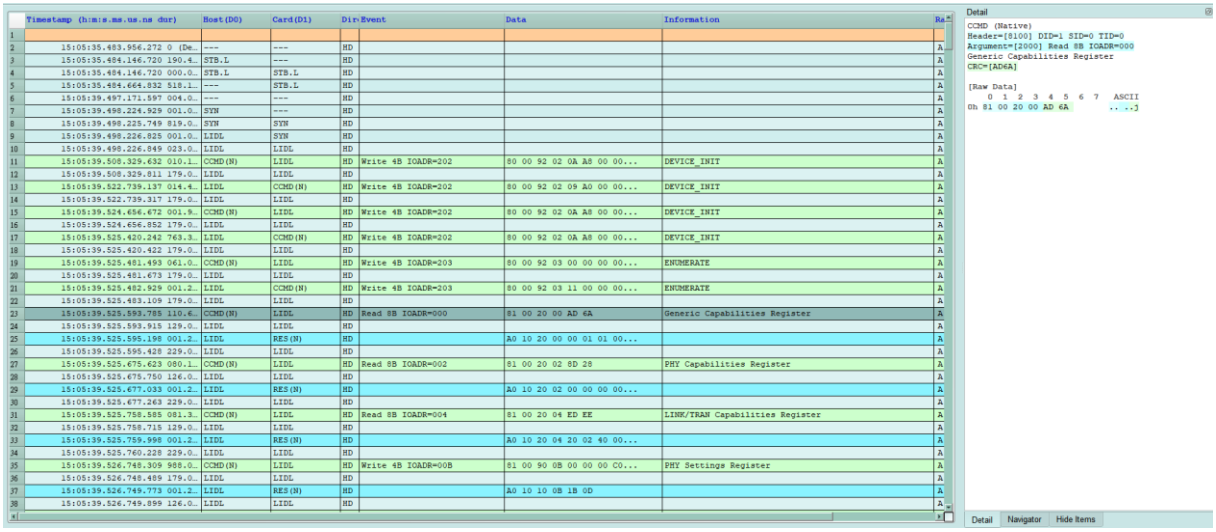
[31] Mode= Check function (0)
[3:0] group 1 Access mode= SDR104 (3h)

[CRC7] = 1Dh (8b:3Bh)

[Raw Data]
0 1 2 3 4 5 6 7 ASCII
0h 46 00 FF FF F3 3B F....;

Detail | Navigator | Hide Items

SD 4.0



	Timestamp (h:m:s.ms.us.ns dur)	Host(D0)	Card(D1)	Dir	Event	Data	Information	Ra
1								
2	15:05:35.483.956.272 0 (De...	---	---	HD				A
3	15:05:35.484.146.720 190.4...	STB.L	---	HD				A
4	15:05:35.484.146.720 000.0...	STB.L	STB.L	HD				A
5	15:05:35.484.664.832 518.1...	---	STB.L	HD				A
6	15:05:39.497.171.597 004.0...	---	---	HD				A
7	15:05:39.498.224.929 001.0...	SYN	---	HD				A
8	15:05:39.498.225.749 819.0...	SYN	SYN	HD				A
9	15:05:39.498.226.825 001.0...	LIDL	SYN	HD				A
10	15:05:39.498.226.849 023.0...	LIDL	LIDL	HD				A
11	15:05:39.508.329.632 010.1...	CCMD(N)	LIDL	HD	Write 4B IOADR=202	80 00 92 02 0A A8 00 00...	DEVICE_INIT	A
12	15:05:39.508.329.811 179.0...	LIDL	LIDL	HD				A
13	15:05:39.522.739.137 014.4...	LIDL	CCMD(N)	HD	Write 4B IOADR=202	80 00 92 02 09 A0 00 00...	DEVICE_INIT	A
14	15:05:39.522.739.317 179.0...	LIDL	LIDL	HD				A
15	15:05:39.524.656.672 001.9...	CCMD(N)	LIDL	HD	Write 4B IOADR=202	80 00 92 02 0A A8 00 00...	DEVICE_INIT	A
16	15:05:39.524.656.852 179.0...	LIDL	LIDL	HD				A
17	15:05:39.525.420.242 763.3...	LIDL	CCMD(N)	HD	Write 4B IOADR=202	80 00 92 02 0A A8 00 00...	DEVICE_INIT	A
18	15:05:39.525.420.422 179.0...	LIDL	LIDL	HD				A
19	15:05:39.525.481.493 061.0...	CCMD(N)	LIDL	HD	Write 4B IOADR=203	80 00 92 03 00 00 00 00...	ENUMERATE	A
20	15:05:39.525.481.673 179.0...	LIDL	LIDL	HD				A
21	15:05:39.525.482.929 001.2...	LIDL	CCMD(N)	HD	Write 4B IOADR=203	80 00 92 03 11 00 00 00...	ENUMERATE	A
22	15:05:39.525.483.109 179.0...	LIDL	LIDL	HD				A
23	15:05:39.525.593.785 110.6...	CCMD(N)	LIDL	HD	Read 8B IOADR=000	81 00 20 00 AD 6A	Generic Capabilities Register	A
24	15:05:39.525.593.915 129.0...	LIDL	LIDL	HD				A
25	15:05:39.525.595.198 001.2...	LIDL	RES(N)	HD		A0 10 20 00 00 01 01 00...		A
26	15:05:39.525.595.428 229.0...	LIDL	LIDL	HD				A
27	15:05:39.525.675.623 080.1...	CCMD(N)	LIDL	HD	Read 8B IOADR=002	81 00 20 02 8D 28	PHY Capabilities Register	A
28	15:05:39.525.675.750 126.0...	LIDL	LIDL	HD				A
29	15:05:39.525.677.033 001.2...	LIDL	RES(N)	HD		A0 10 20 02 00 00 00 00...		A
30	15:05:39.525.677.263 229.0...	LIDL	LIDL	HD				A
31	15:05:39.525.758.585 081.3...	CCMD(N)	LIDL	HD	Read 8B IOADR=004	81 00 20 04 ED EE	LINK/TRAN Capabilities Register	A
32	15:05:39.525.758.715 129.0...	LIDL	LIDL	HD				A
33	15:05:39.525.759.998 001.2...	LIDL	RES(N)	HD		A0 10 20 04 20 02 40 00...		A
34	15:05:39.525.760.228 229.0...	LIDL	LIDL	HD				A
35	15:05:39.526.748.309 988.0...	CCMD(N)	LIDL	HD	Write 4B IOADR=00B	81 00 90 0B 00 00 00 C0...	PHY Settings Register	A
36	15:05:39.526.748.489 179.0...	LIDL	LIDL	HD				A
37	15:05:39.526.749.773 001.2...	LIDL	RES(N)	HD		A0 10 10 0B 1B 0D		A
38	15:05:39.526.749.899 126.0...	LIDL	LIDL	HD				A

Detail
CCMD (Native)
Header=[8100] DID=1 SID=0 TID=0
Argument=[2000] Read 8B IOADR=000
Generic Capabilities Register
CRC=[AD6A]

[Raw Data]
0 1 2 3 4 5 6 7 ASCII
0h 81 00 20 00 AD 6A .. ..j

Detail | Navigator | Hide Items

II. Use 32Gb RAM as the buffer to stream all SD 3.0 / SD 4.0 data into the SSD HD in order to record all data flow from Low Power Mode to High Speed Mode.

III. "Data Filter" filters unwanted data to save memory.

IV. "Search" searches specific data.

V. "CRC Packet" displays and counts CRC

VI. SD 3.0 / SD 4.0 command statistics include numbers of packets, individual command, different data length, and errors

SD 3.0

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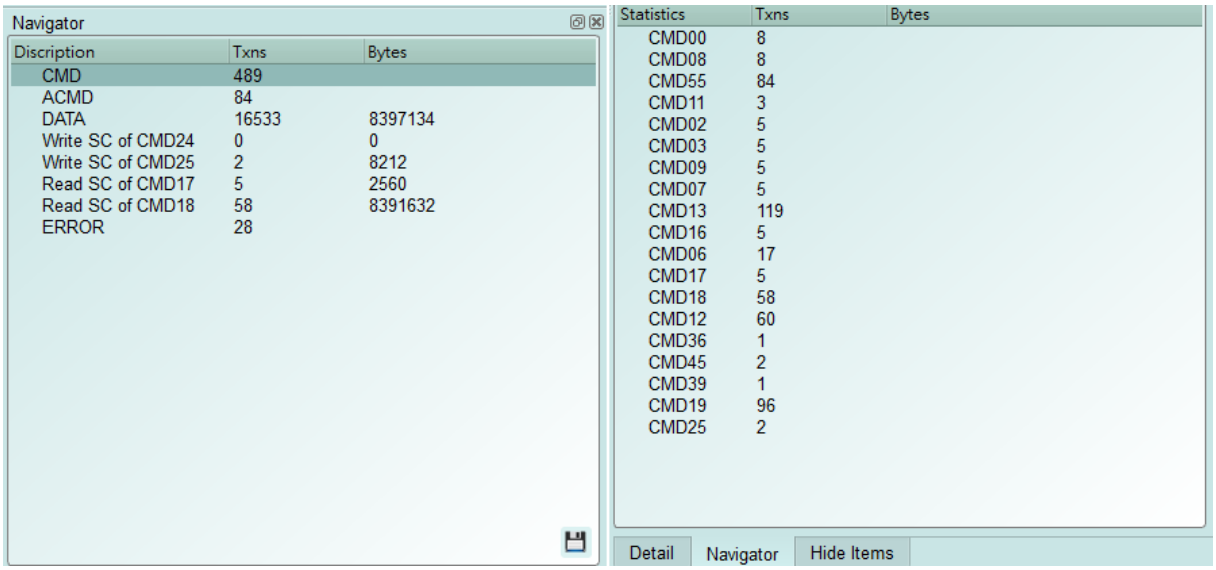
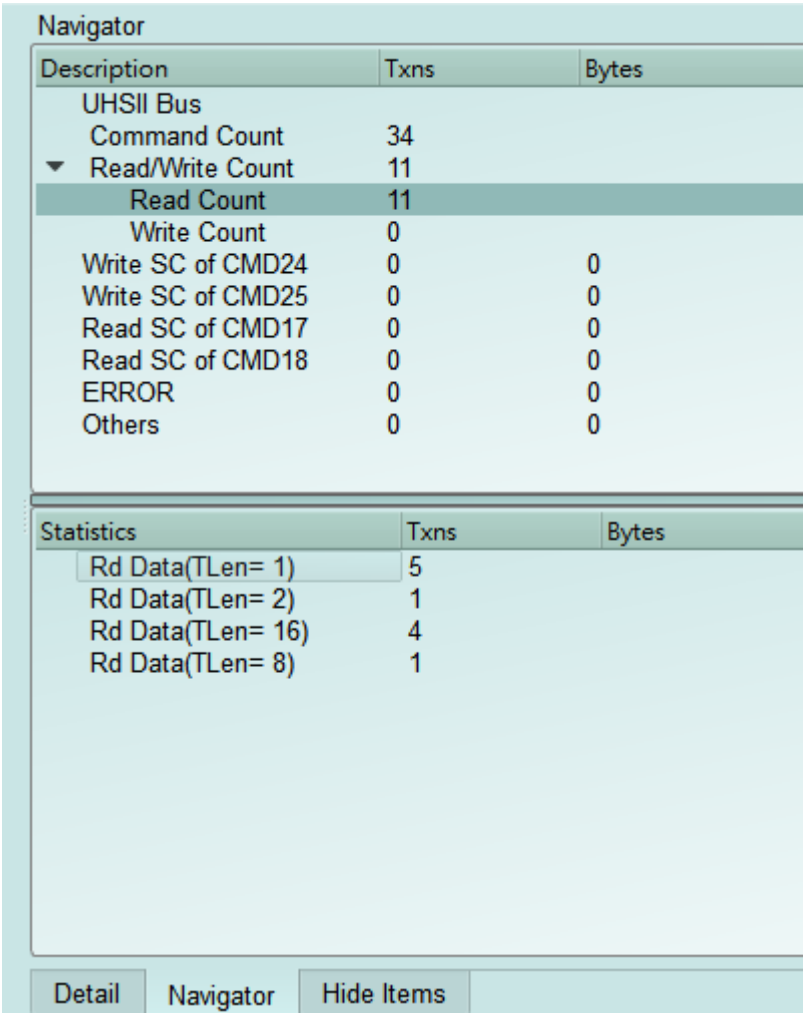


SD 4.0



VII. SD 3.0 command trigger

1. SD 3.0

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a. Trigger parameters include commands and data in order to cover all kinds of packets.

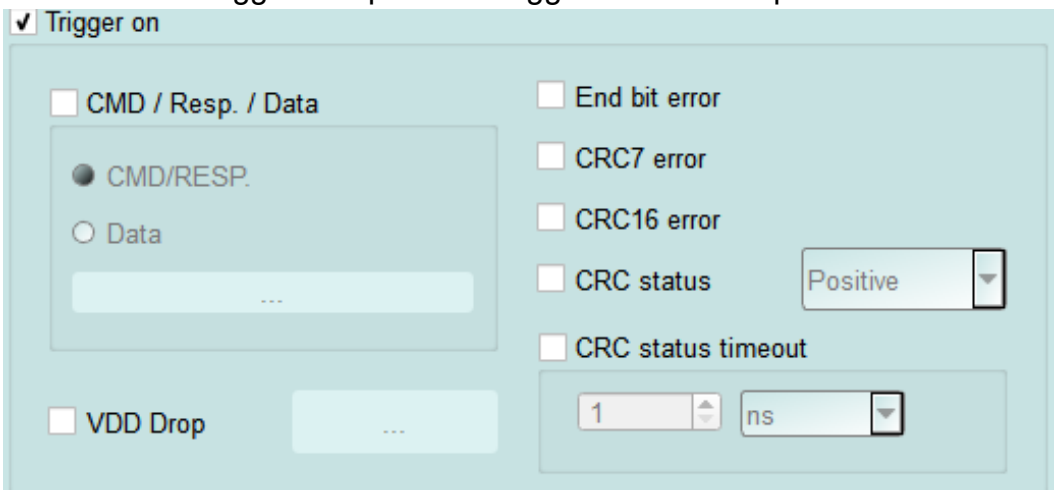
b. Command or 16 byte Data.

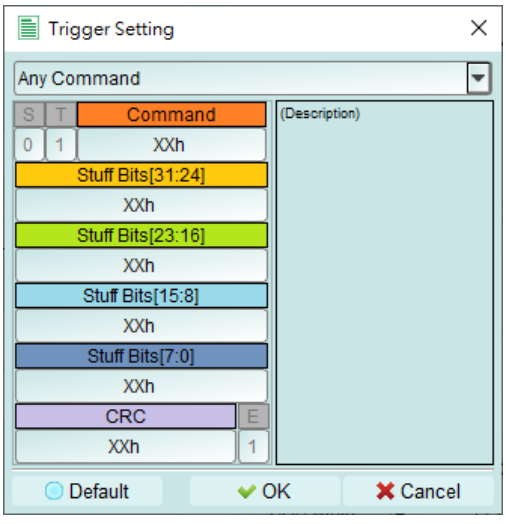
c. CRC7, CRC16, End Bit Error.

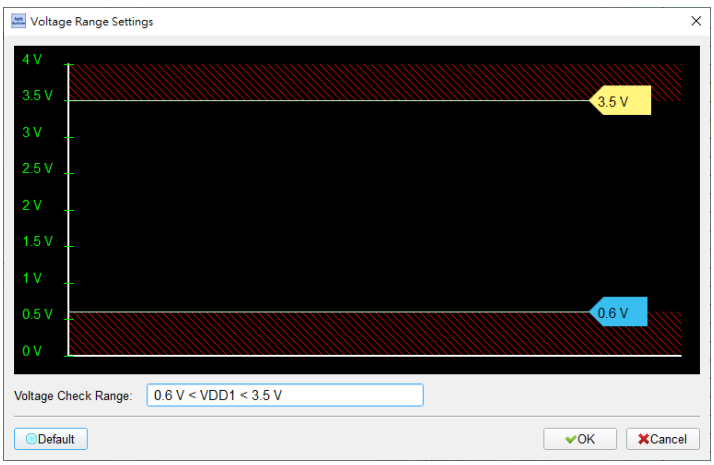
d. CRC Status timeout, CRC Status pattern.

e. VCC drop, VCCQ2 drop.

f. The Trigger-Out port is to trigger a DSO to capture waveforms







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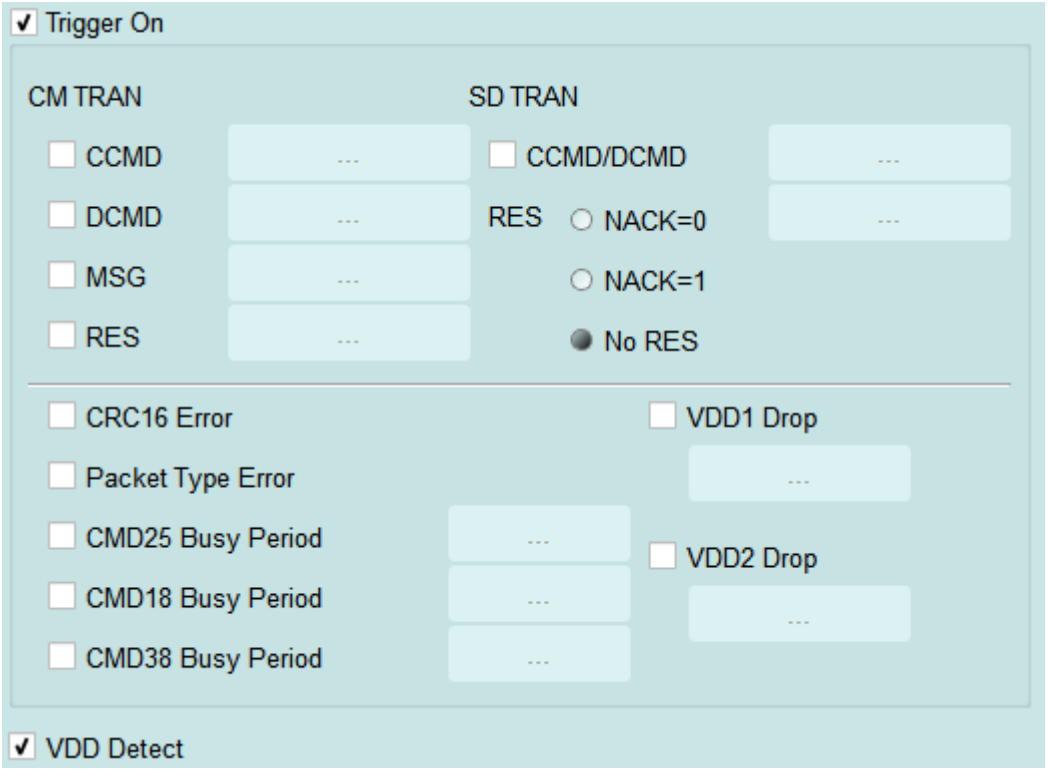
2. SD 4.0
   - **a.** Trigger parameters include commands and data in order to cover all kinds of packets.
   - **b.** Command, Message, Response
   - **c.** CRC16, Packet Type Error.
   - **d.** VDD1 drop, VDD2 drop.
   - **e.** The Trigger-Out port is to trigger a DSO to capture waveforms



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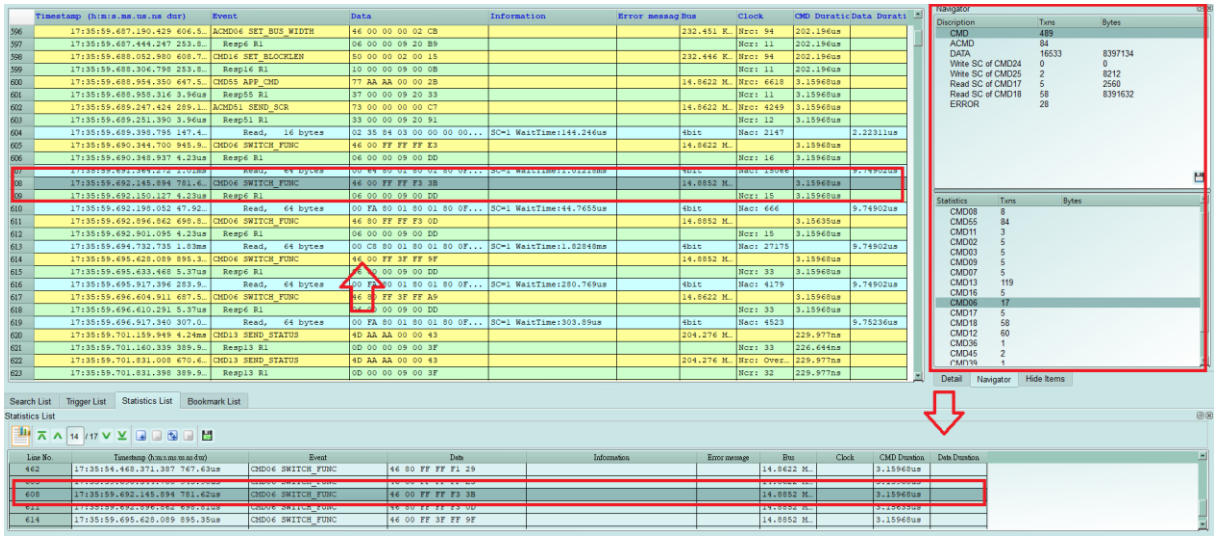
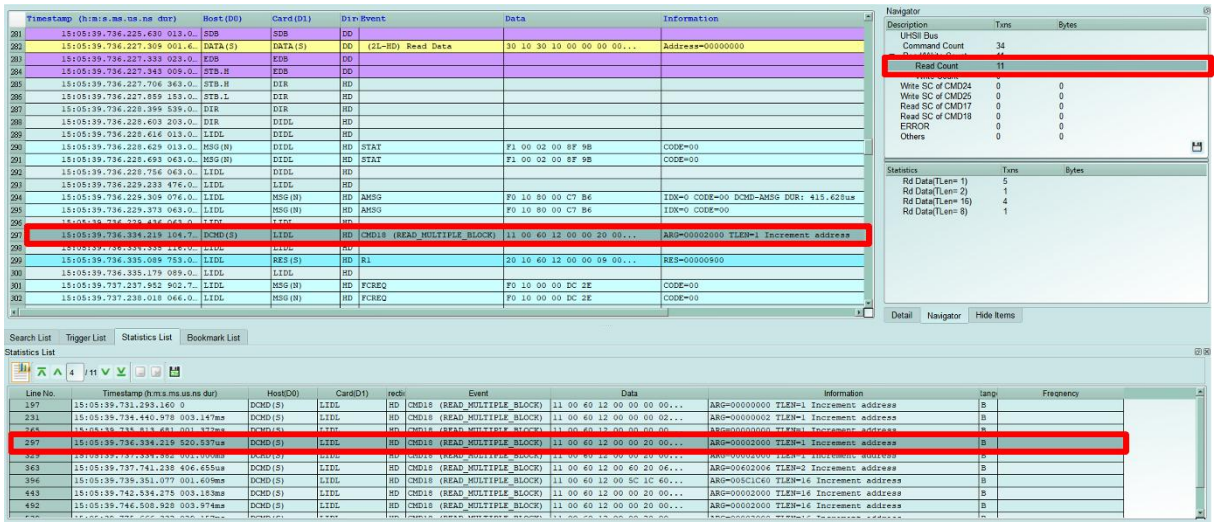
VIII. Report area

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

SD 3.0



SD 4.0



IX. Settings

SD 3.0

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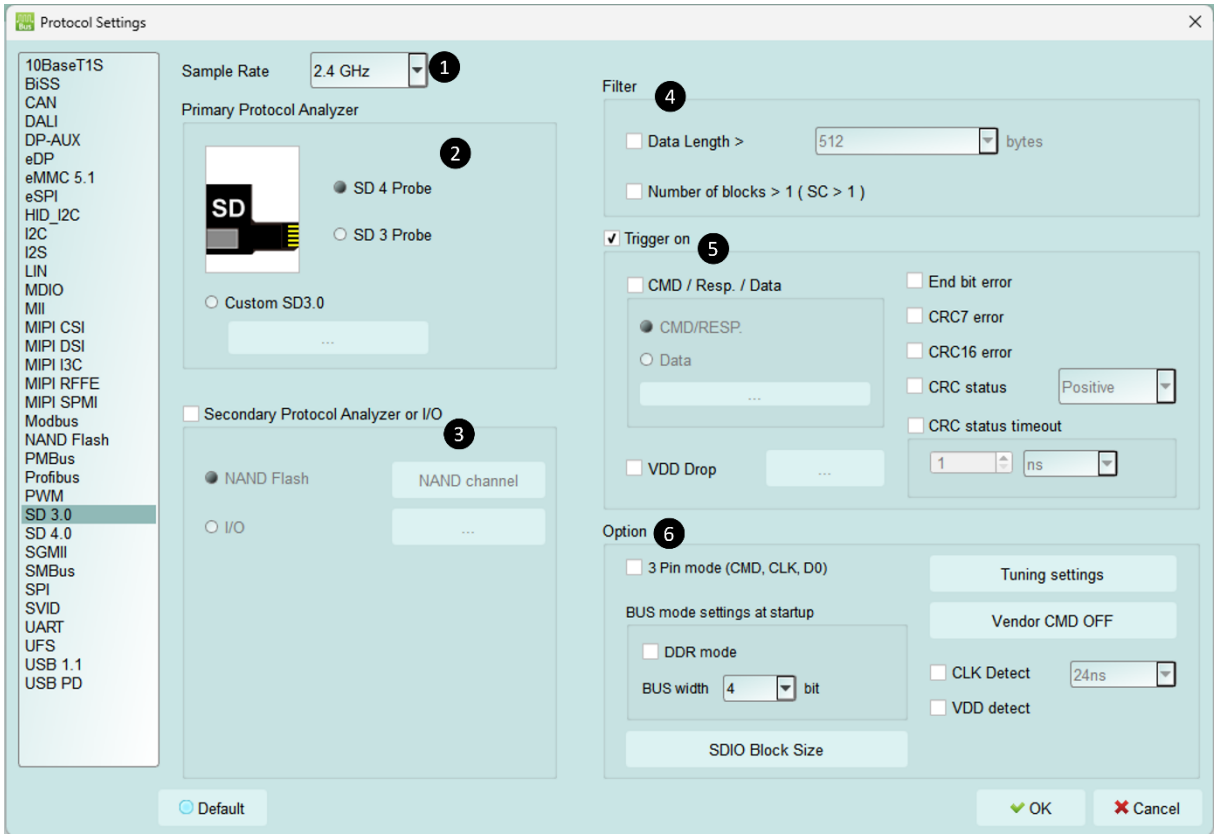

1. **Sample Rate:** Choose the sampling rate to use. To enable the Secondary Protocol Analyzer – NAND Flash option, the sampling rate must be set below 1GHz,
2. **Primary Protocol Analyzer:** Choose to use the probe type, and set the channel / trigger level,
3. **Secondary Protocol Analyzer or I/O:** An additional set of specified logic analysis can be opened to analyze the remaining available pins at the same time,
4. **Filter:** Each Data Frame can specify the size of the collection, and data larger than the set value will not be recorded
5. **Trigger on:** CMD, DATA, ERROR, Voltage, Timeout, CRC Status trigger conditions can be set
6. **Option:**
   a. **3 Pin mode:** After connecting CLK, CMD, D0, the protocol flow and status agreement can be analyzed,
   b. **Startup:** It needs to be set to the mode of the current acquisition, the mode of the test object is running, and has the Tuning function.
   c. **Tuning setting:** Adjust channel phase.

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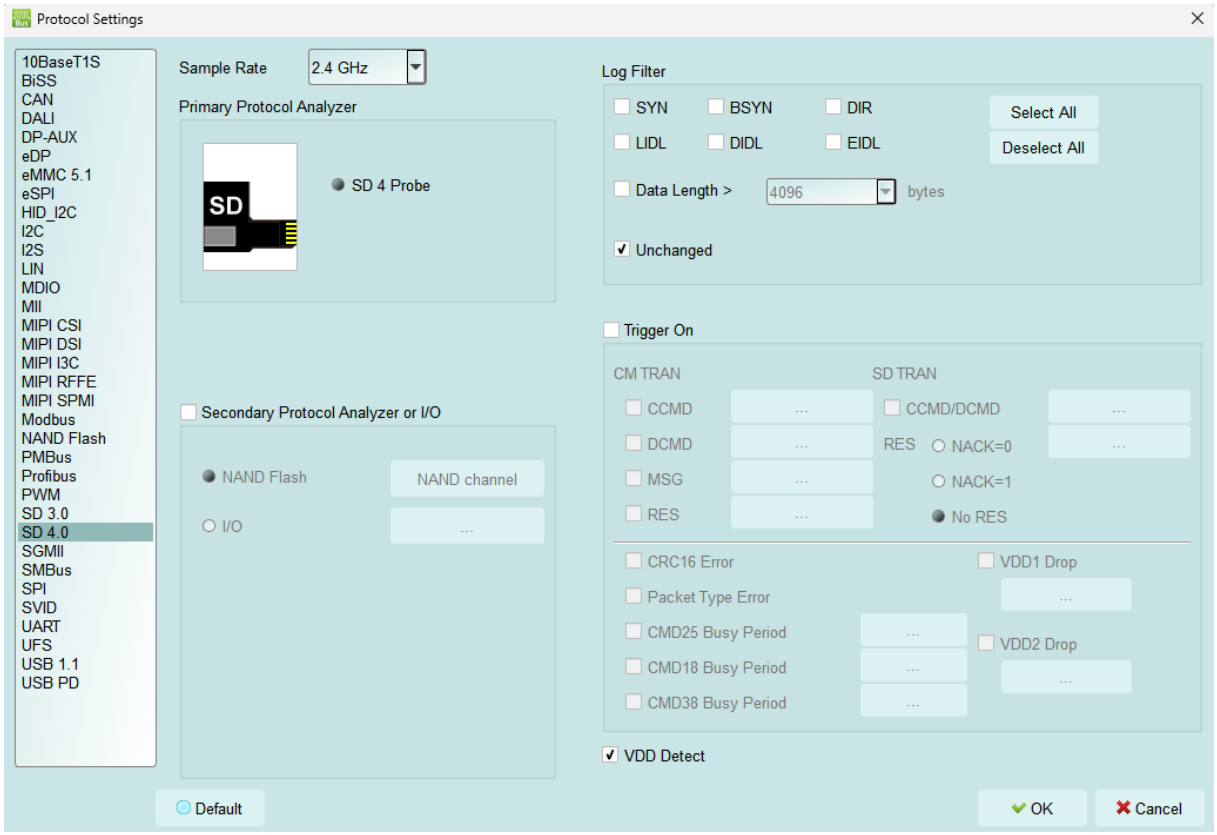
d. **Vendor CMD:** Can change the name of the command group by itself, with or without data,

e. **CLK Detect:** Can detect whether CLK has action,

f. **Two sets of voltage detection function**

SD 4.0



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FAQ

1. **What SD version is supported?**

   A：Support SD3.0 SDR104, SD6.0 Legacy mode SDR104 / DDR200, SD 4.0

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 active probe to reduce the interference of the object to be measured and improve the signal quality.

3. **Is Tx supported?**

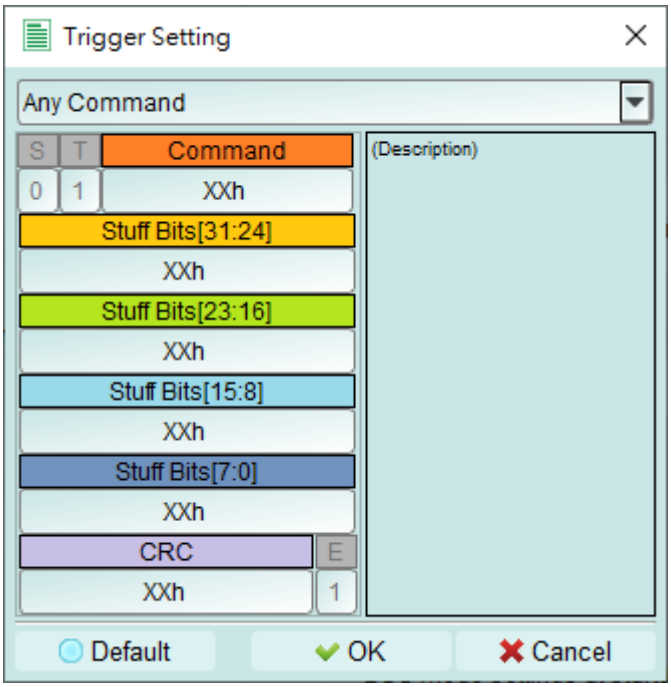
   A: No

4. **Precautions during measurement**

   Please make sure to connection according to the “Probe and test object connection” on page 9.

5. **Can I specify an SD 3.0 / SD 4.0 packet as the trigger point function?**

   A: You can specify specific SD 3.0 / SD 4.0 packet or Error to trigger.



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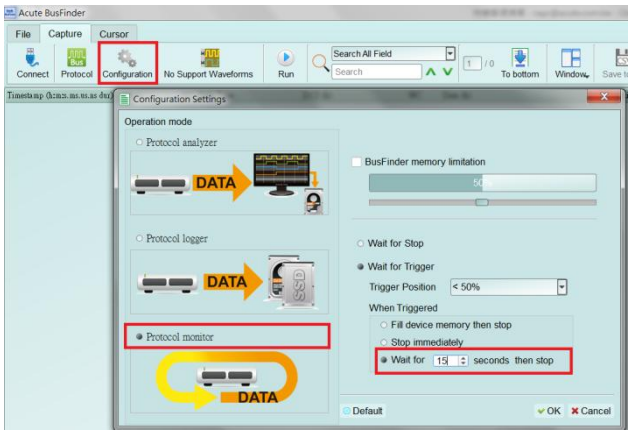
6. Is it possible to set an SD 3.0 / SD 4.0 starting point, and specify how much time to capture Data?

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.



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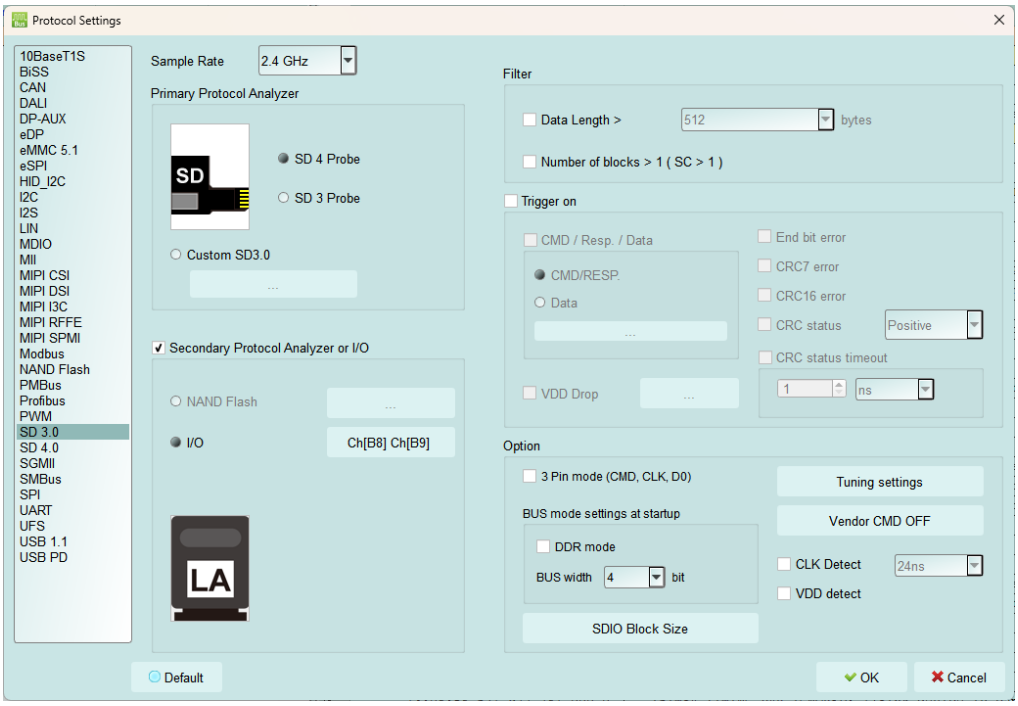
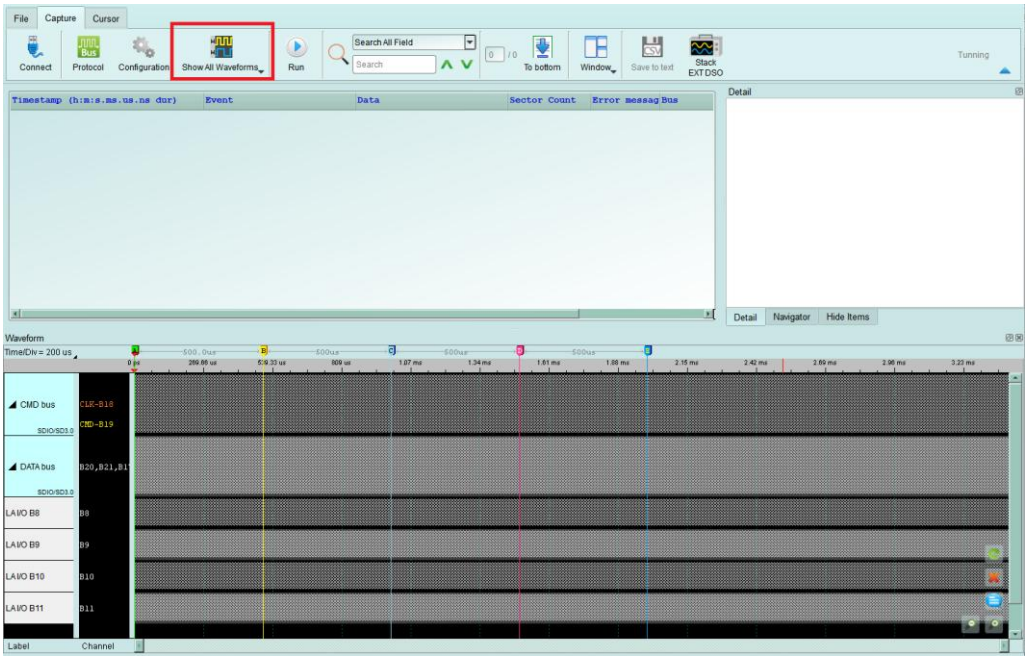
7. Secondary Protocol Analyzer or I/O



While using the SD3.0 protocol analyzer, you can additionally enable the NAND Flash logic analyzer function or additional I/O pins for analysis.

To use this function, you must turn on the “Show Waveform” on the main screen of the protocol analyzer.



Since the analysis of NAND Flash requires the use of more channels, an LA probe needs to be connected to Slot A, and it can only be turned on using a sampling rate of 1GHz.

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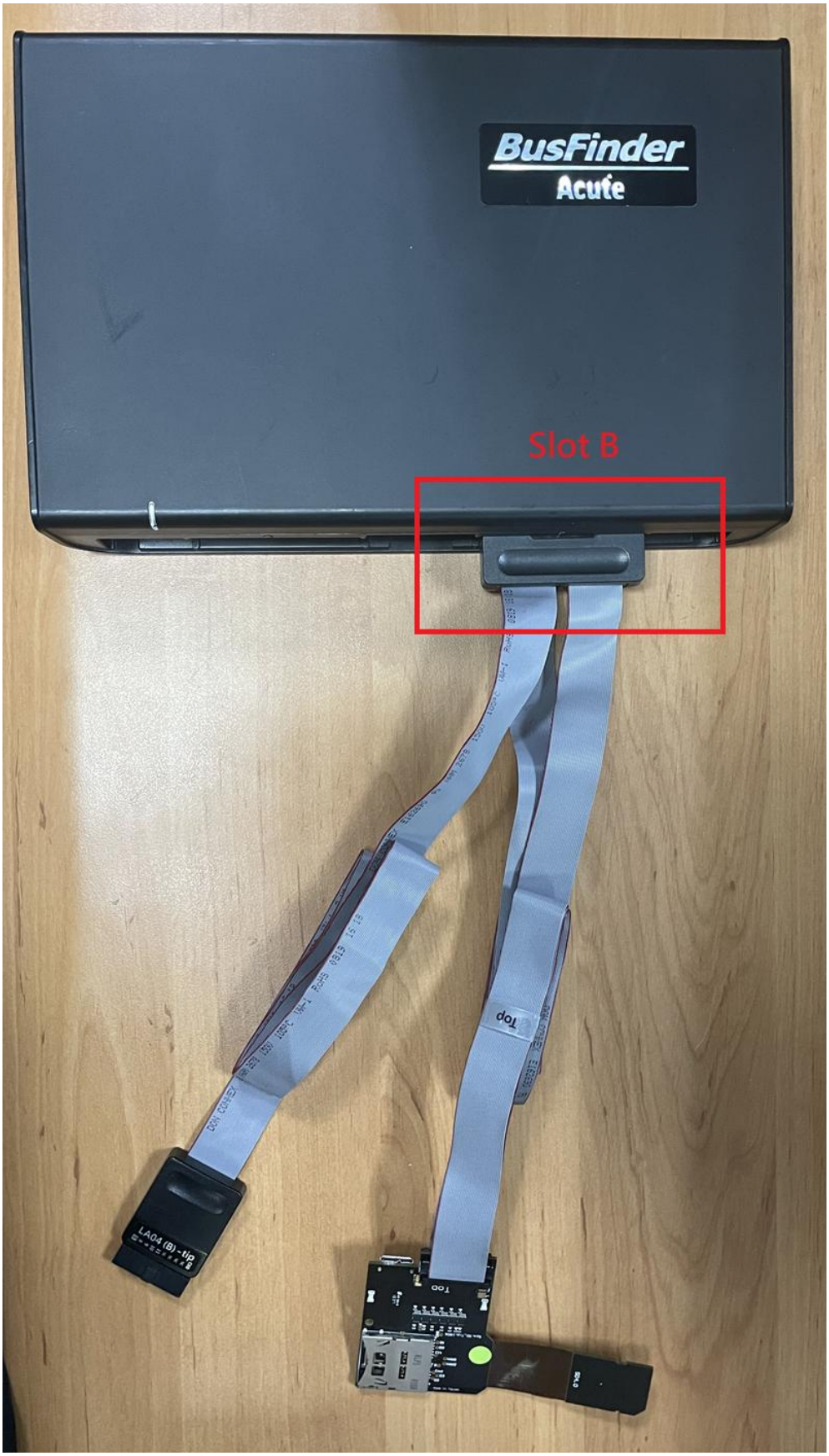
BusFinder and Probe connection

The BusFinder can only use Slot B as the probe connection slot.



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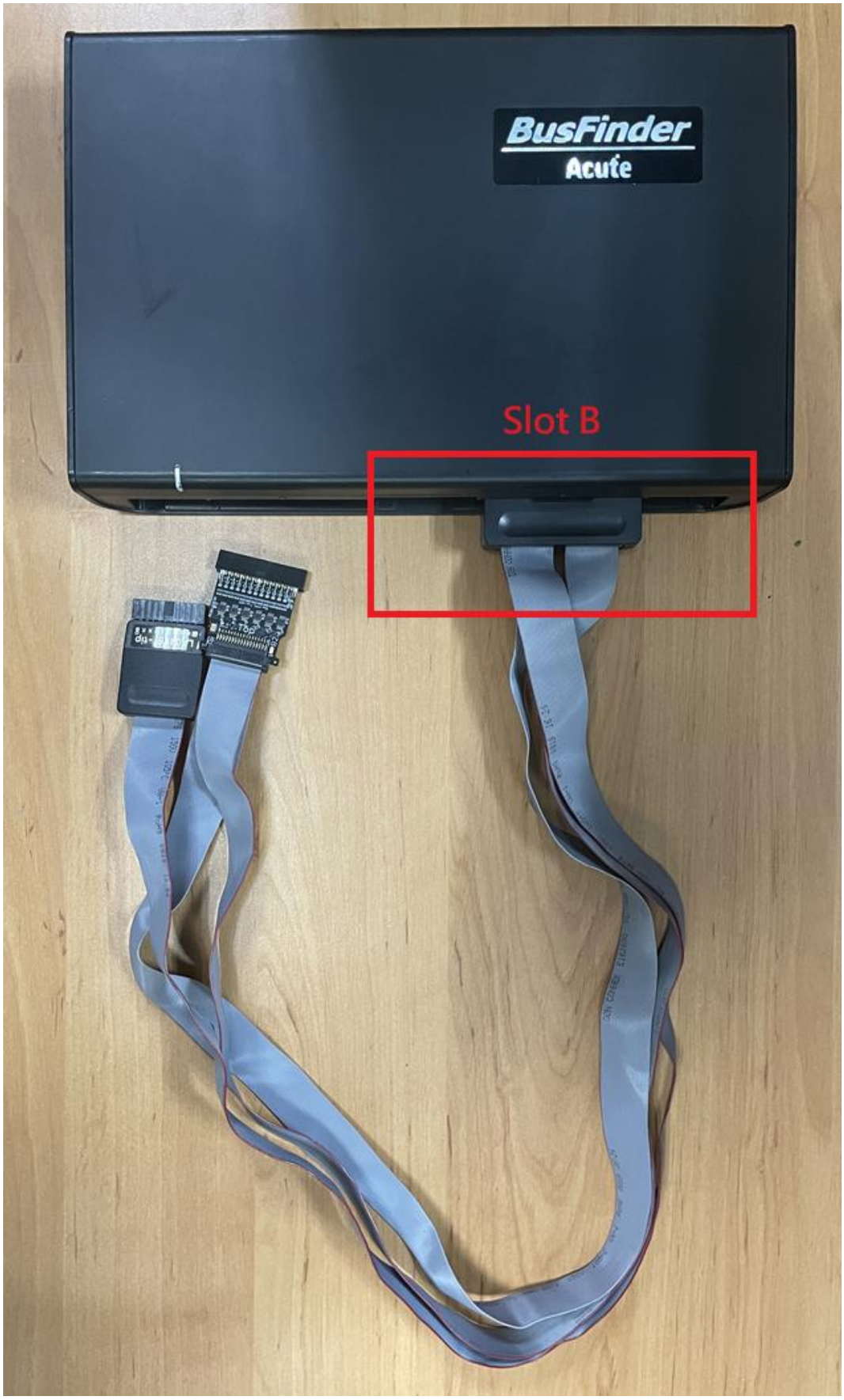

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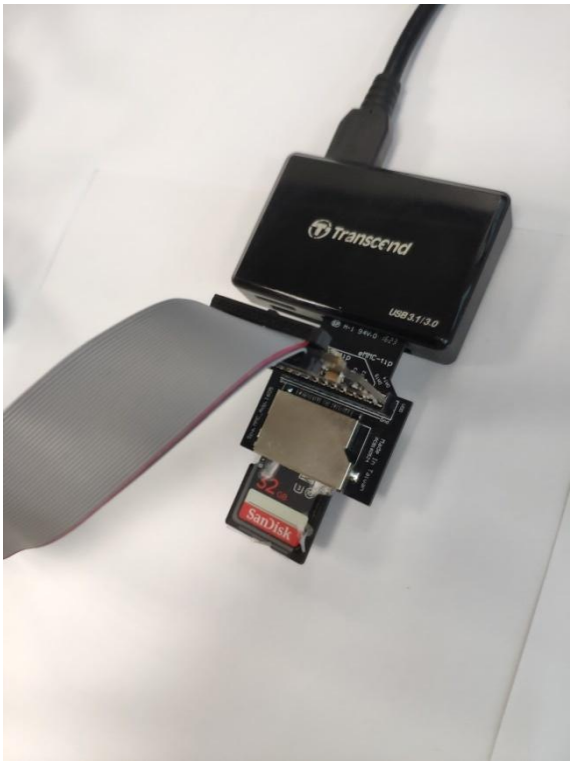
Probe and test object connection

SD 3.0



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SD 4.0

SD 4.0 has an additional high-speed cable than SD 3.0, which must be connected to the cable when using it.

SD4.0 adapter board test point:

When to use:

a. When you need to use the oscilloscope to view the waveform at the same time

b. When the flexible circuit of the transfer board can be checked whether it is normal, the electric meter can measure whether the golden finger of the front end is connected to the measuring point.

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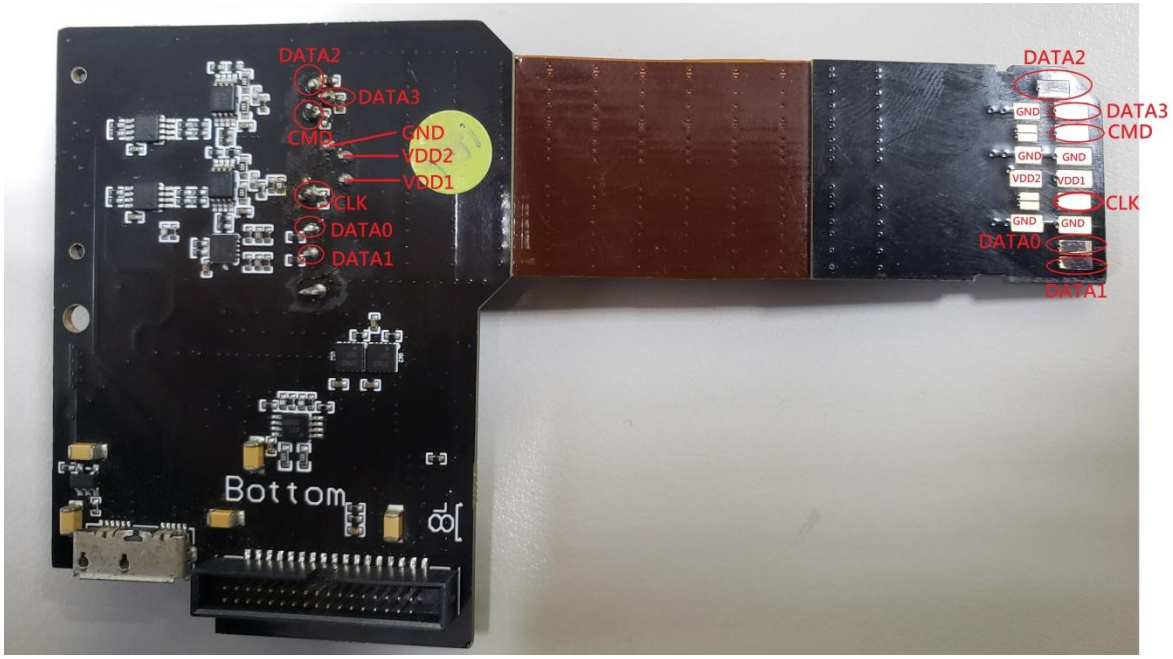

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