Notes for SD driver

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Case Study

Problem:

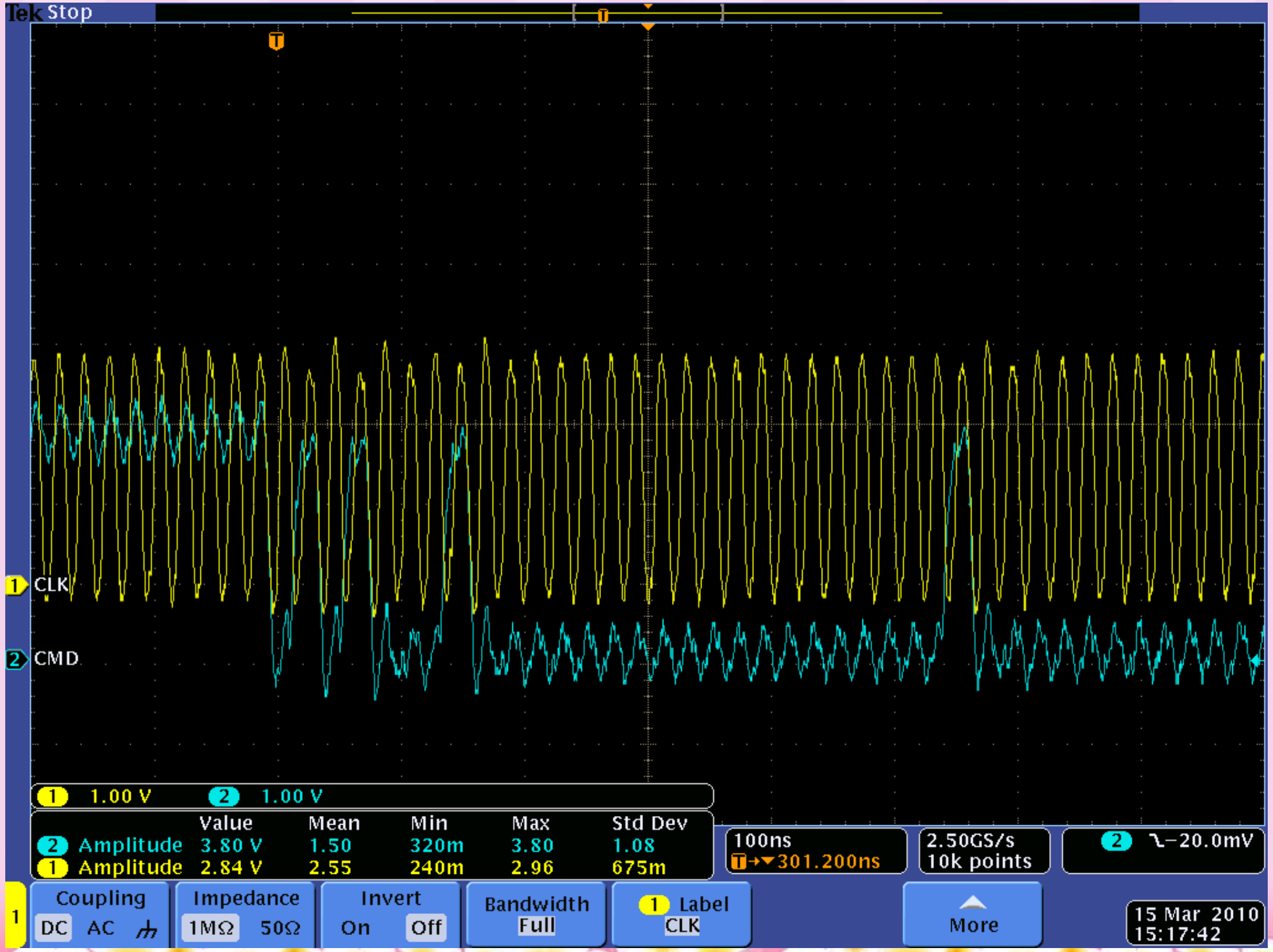
Always show 'Card damage(記憶卡損毀' or 'Empty card (記憶卡空白' when entering into OS. But it's solved by changing SD card sub board.

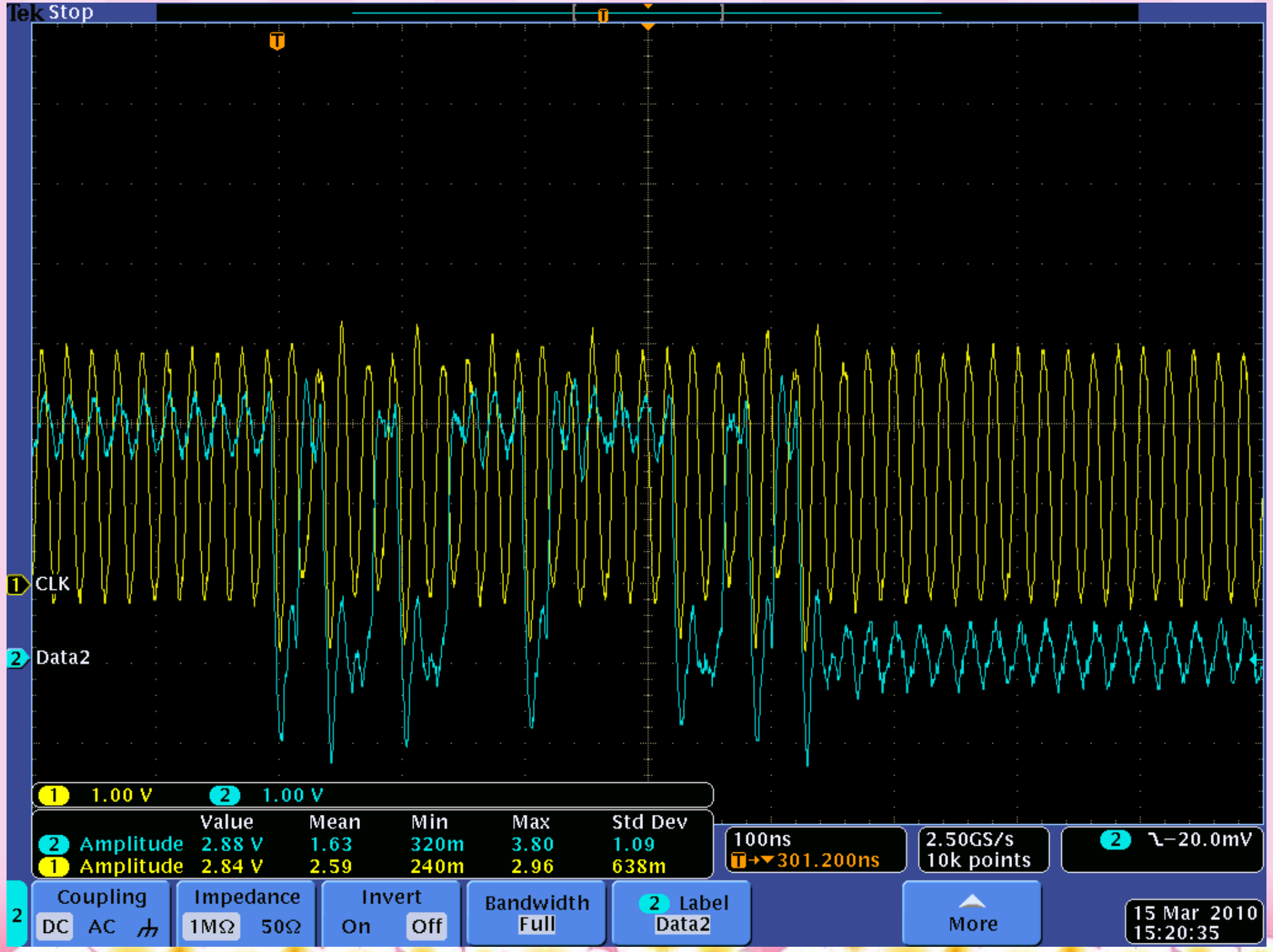
Analysis:

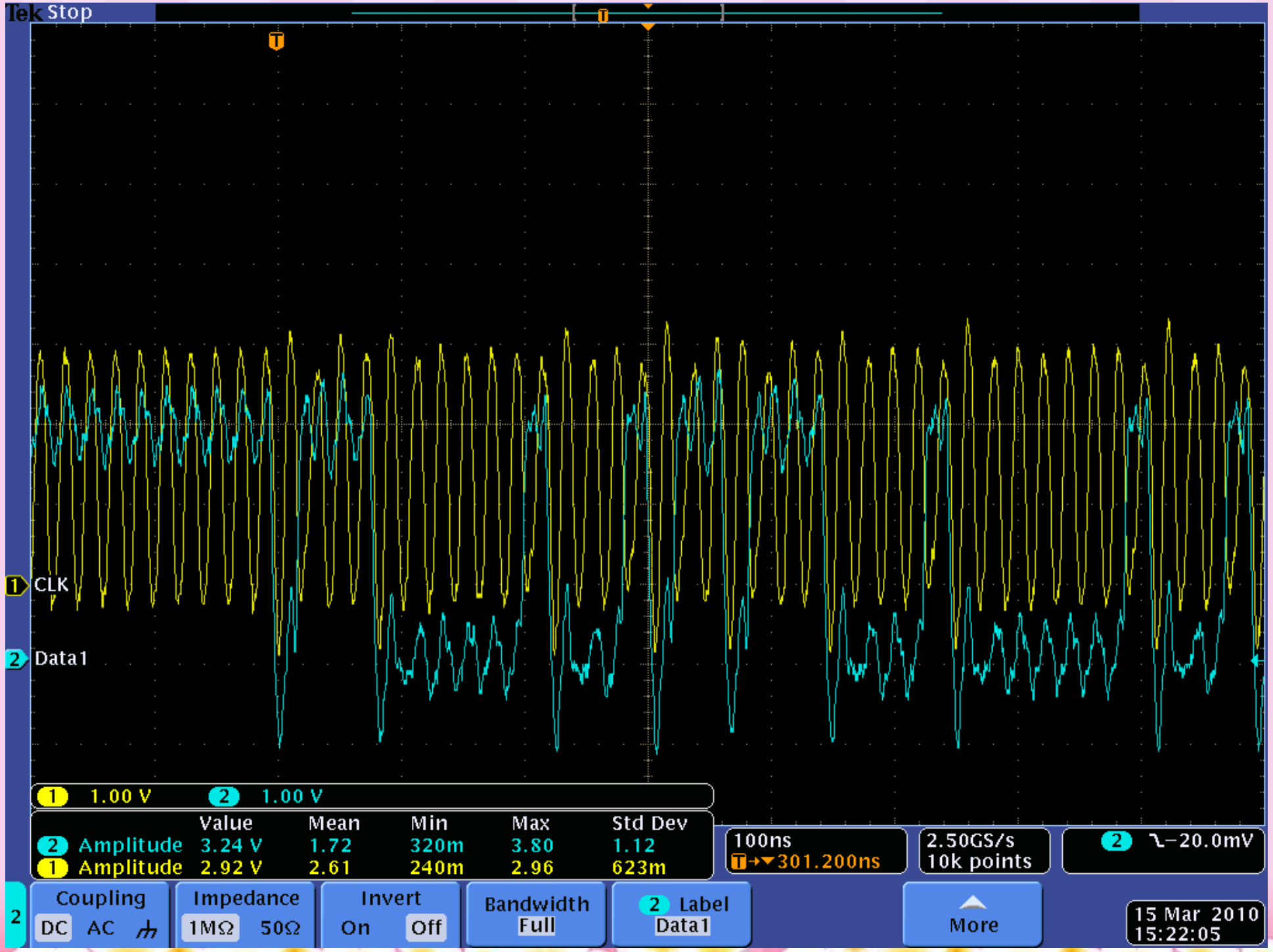
Card can be detected -> detect pin and IRQ is okay.
Card can be identified -> CMD line is okay.
Can pass FTM (card detection & read/write data) -> 1 bit data line is okay, but how about 4 bits (in OS) ?
My logs show read/write FAT failed in volume daemon

Result:

We suspect that DATA line is corrupted.
HW measurement for DATA line is always high (consider as an abnormal case) when booting up.
Refer to the following pictures. (correct pattern?)


Tek Stop
1 CLK
2 CMD
1 1.00 V 2 1.00 V
Value Mean Min Max Std Dev
2 Amplitude 3.80 V 1.50 320m 3.80 1.08
1 Amplitude 2.84 V 2.55 240m 2.96 675m
100ns
T→▼301.200ns
2.50GS/s
10k points
2 ⌇−20.0mV
1
Coupling
DC AC
Impedance
1MΩ 50Ω
Invert
On Off
Bandwidth
Full
1 Label
CLK
More
15 Mar 2010
15:17:42


Tek Stop
CLK
Data2
1 1.00 V
2 1.00 V
Value Mean Min Max Std Dev
2 Amplitude 2.88 V 1.63 320m 3.80 1.09
1 Amplitude 2.84 V 2.59 240m 2.96 638m
100ns
301.200ns
2.50GS/s
10k points
2 -20.0mV
Coupling
DC AC
Impedance
1MΩ 50Ω
Invert
On Off
Bandwidth
Full
2 Label
Data2
More
15 Mar 2010
15:20:35


Tek Stop
1 CLK
2 Data1
1 1.00 V 2 1.00 V
Value Mean Min Max Std Dev
2 Amplitude 3.24 V 1.72 320m 3.80 1.12
1 Amplitude 2.92 V 2.61 240m 2.96 623m
100ns
T→▼301.200ns
2.50GS/s
10k points
2 ∖−20.0mV
2
Coupling
DC AC
Impedance
1MΩ 50Ω
Invert
On Off
Bandwidth
Full
2 Label
Data1
More
15 Mar 2010
15:22:05

Case Study - 2010.03.16

FA3.