

SPECIFICATION

MODEL: B11011-eMMC

PART NO: _____

VERSION: V1.06

Approver		Check	Design
GM	PM		

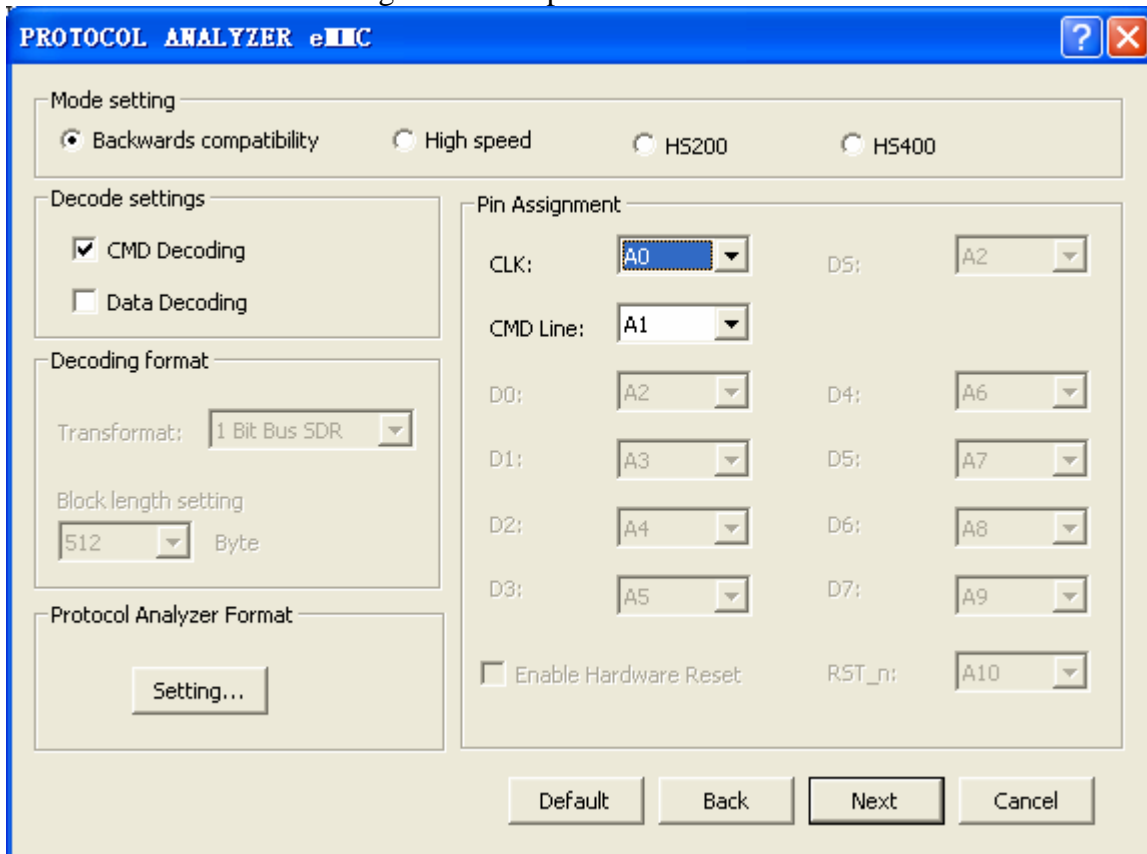
Customer Confirm

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1 User Interface

Please refer to the below image to select options of eMMC module.



Mode setting:

There is four modes: Backwards compatibility, High speed, HS200 and HS400. For HS200 mode, during decoding, if the host transmits data to the device, then it would sample at the rising edge of CLK; if the device transmits data to the host, then it would sample at the previous low position of rising edge of CLK. For HS400, the data send by the host takes CLK as the clock signal, while the data send by the device takes DS as the clock signal.

Decode settings:

CMD Decoding:

Only CLK and CMD Line are available, the module only decodes CMD (command and response), but not Data.

Data Decoding:

Command will be decoded firstly inside the module(its decoding information isn't displayed) and then decode the data packet on the data lines.

Decoding format:

Transformat:

In Backwards compatibility and High speed mode, it has three options: 1Bit Bus SDR, 4Bit Bus SDR and 8 Bit Bus SDR.

In HS200 mode, it has two options: 4Bit Bus SDR and 8 Bit Bus SDR.

In HS400 mode, it has only one option: 8Bit Bus DDR.

Block length setting:

Select one length from the pulldown menu, which includes 2, 4, 8, 16, 32, 64, 128, 256, 512, 1024, 2048, 4096, 8192 and 16384 with Byte as the unit; it is 512 by default.

Pin Assignment:

eMMC needs two channels at least to decode signal. CLK is the clock line, CMD Line is the command line, D0-D7 are data lines and RST_n is reset line. Hardware reset could be enabled or not.

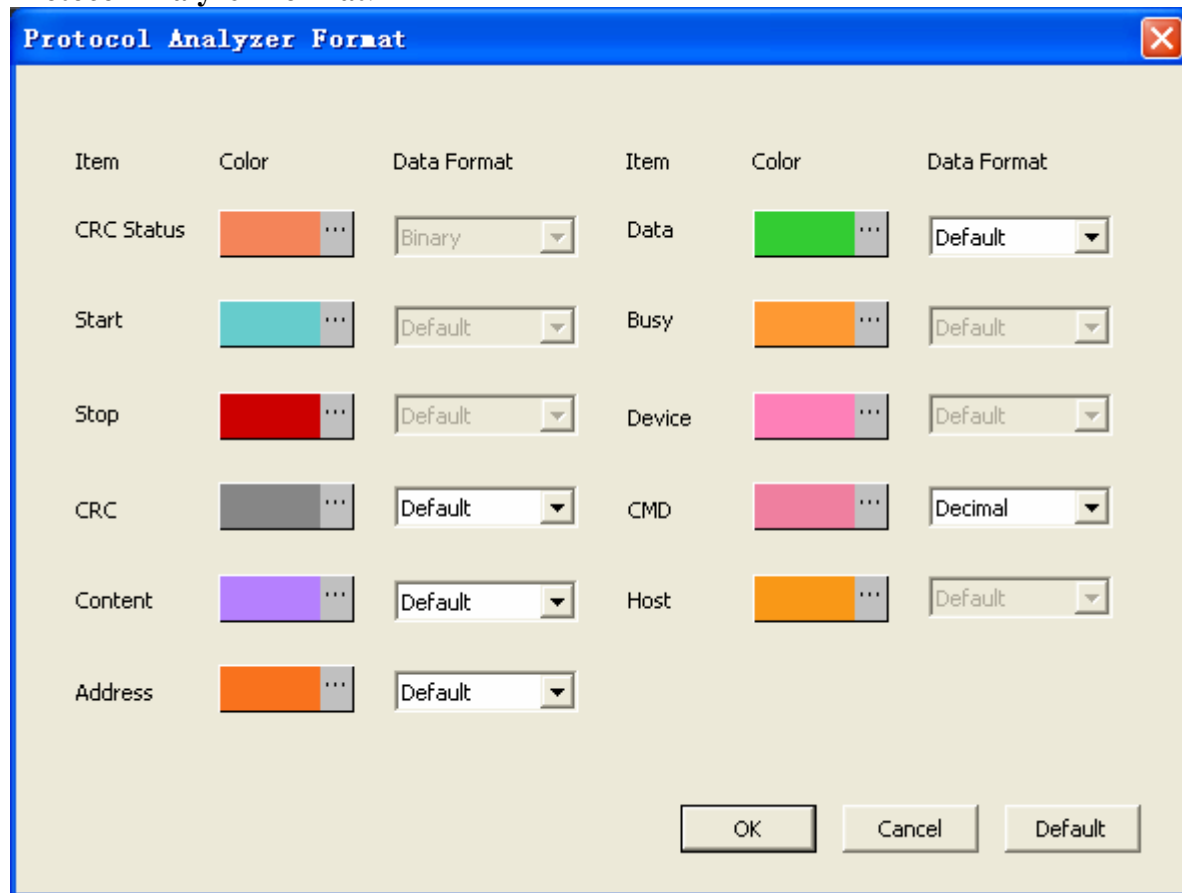
In 1 Bit Bus SDR format, channels of CLK, CMD Line and D0 can be used.

In 4 Bit Bus SDR format, channels of CLK, CMD Line and D0~D3 can be used.









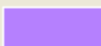


In 8 Bit Bus SDR format, channels of CLK, CMD Line and D0~D7 can be used.

In 8 Bit Bus DDR format, channels of CLK, DS, CMD Line and D0-D7 can be used.

Protocol Analyzer Format:



The image shows a dialog box titled "Protocol Analyzer Format" with a close button (X) in the top right corner. The dialog box contains two columns of settings, each with a header row: "Item", "Color", and "Data Format".

Item	Color	Data Format	Item	Color	Data Format
CRC Status		Binary	Data		Default
Start		Default	Busy		Default
Stop		Default	Device		Default
CRC		Default	CMD		Decimal
Content		Default	Host		Default
Address		Default			

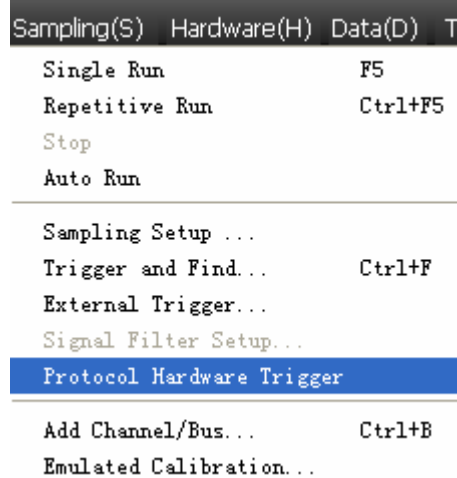
At the bottom of the dialog box, there are three buttons: "OK", "Cancel", and "Default".

Users can set the color of the packet as their requirements. The items (Data, CMD, CRC, Content, Address) can be set as Binary, Decimal, Hexadecimal, ASCII or Default. And the data format of these items in the Waveform Display Area and Packet List is controlled by the Protocol Analyzer. The default data format is controlled by the main program and the data format of these items is Default except CMD is Decimal..

Hardware Trigger

Hardware trigger could help capturing the needed data more accurate and faster. The hardware will do the hardware trigger of packet, while the module will provide UI for users to set and convert their settings to hardware parameters, then sent them to the main program which would transfer them to the hardware to execute.

Group a eMMC bus, then click Sampling→Protocol Hardware Trigger.

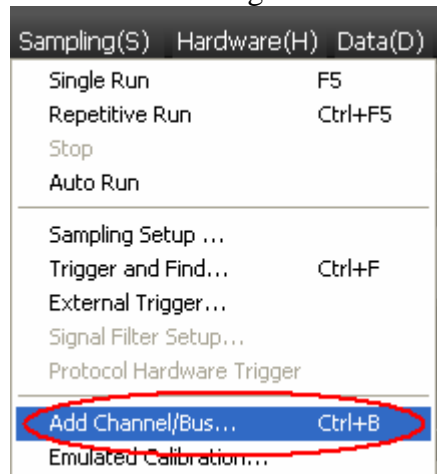
A screenshot of the 'Hardware Trigger Setting' dialog box. It has a blue title bar with a close button. The dialog contains several settings: 'Active' is checked; 'Packet Format' is set to 'Command/Response'; 'Device', 'Command', 'Address/Content', 'CRC', and 'Stop' are all set to 'Don't Care'; 'Data' is set to '1'. Below these settings is a 'Preview' section showing a sequence of data blocks: a green 'Start' block followed by five black 'Don't Care' blocks. At the bottom are 'Ok', 'Cancel', and 'Default' buttons.

1. Active: Activate hardware trigger.
2. Packet Format: It has two options: Command/Response and Block. Command/Response means command trigger, while Block means data trigger. It is Command/Response by default.
3. Device: Set the host or device data. Host is the command send by host, while Device is the command responded by device. It has three options: Don't Care, Host and Device. It is Don't Care by default.
4. Command: Set the command type. It includes Don't Care and CMD0-CMD63. It is Don't Care by

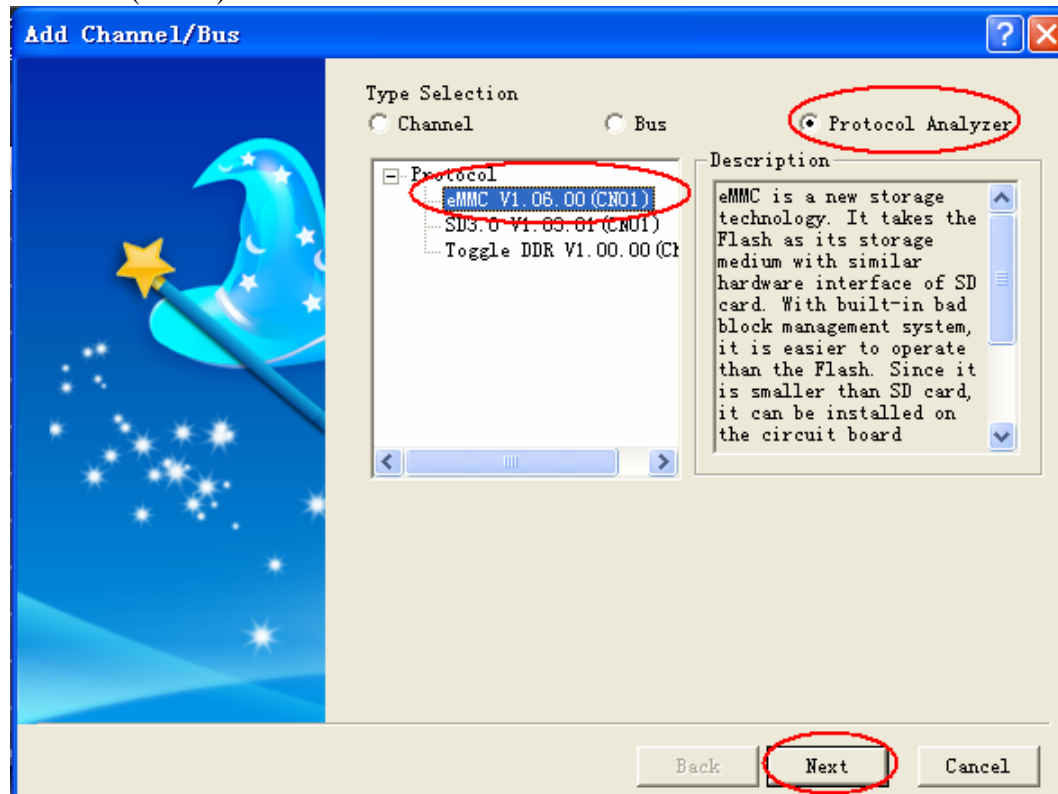
-
- default.
5. Address/Content: Set Address or Content data. It has three options: Don't Care, Address and Content. It is Don't Care by default.
 6. CRC: Set CRC data. It has two options: Don't Care and CRC. It is Don't Care by default.
 7. Stop: It has two options: Don't Care and Stop. It is Don't Care by default.
 8. First combo box of Data: Set Data. 5 could be set at most for 1 line, and 23 for 4 lines and 47 for 8 lines. It is 1 by default.
 9. Second combo box of Data: Set Data. It has two options: Don't Care and Data. It is Don't Care by default
 10. Data Input Box: Set Data. It is 0 by default.
 11. Preview: Preview the packet data. Error Frame and OverLoad Frame have no preview.

2 Operating Instructions

STEP 1. Select the Add Channel/Bus item on the pull-down menu of the Sampling(S) to open the Add Channel/Bus dialog box.



STEP 2. Select the Protocol Analyzer item in the Add Channel/Bus dialog box, select the eMMC V1.06.00(CN01) and then click Next.



STEP 3. Set the mode.

PROTOCOL ANALYZER eMMC

Mode setting

☒ Backwards compatibility ☐ High speed ☐ HS200 ☐ HS400

Decode settings

☒ CMD Decoding
☐ Data Decoding

Decoding format

Transformat: 1 Bit Bus SDR

Block length setting
512 Byte

Pin Assignment

CLK: A0 D5: A2
CMD Line: A1
D0: A2 D4: A6
D1: A3 D5: A7
D2: A4 D6: A8
D3: A5 D7: A9
☐ Enable Hardware Reset RST_n: A10

Setting...

Default Back Next Cancel

STEP 4. Set the decode .

PROTOCOL ANALYZER eMMC

Mode setting

☒ Backwards compatibility ☐ High speed ☐ HS200 ☐ HS400

Decode settings

☒ CMD Decoding
☐ Data Decoding

Decoding format

Transformat: 1 Bit Bus SDR

Block length setting
512 Byte

Pin Assignment

CLK: A0 D5: A2
CMD Line: A1
D0: A2 D4: A6
D1: A3 D5: A7
D2: A4 D6: A8
D3: A5 D7: A9
☐ Enable Hardware Reset RST_n: A10

Setting...

Default Back Next Cancel

STEP 5. Set the decoding format.

The screenshot shows the 'PROTOCOL ANALYZER eMMC' dialog box. The 'Mode setting' section has 'Backwards compatibility' selected. The 'Decode settings' section has both 'CMD Decoding' and 'Data Decoding' checked. The 'Decoding format' section, which is highlighted with a red rectangle, contains a 'Transformat:' dropdown set to '1 Bit Bus SDR' and a 'Block length setting' section with a dropdown set to '512' and the unit 'Byte'. The 'Pin Assignment' section on the right lists various pins (CLK, CMD Line, D0-D7, RST_n) with their corresponding pin numbers (A0-A10) selected in dropdown menus. At the bottom, there are buttons for 'Default', 'Back', 'Next', and 'Cancel'.

PROTOCOL ANALYZER eMMC

Mode setting
☒ Backwards compatibility ☐ High speed ☐ HS200 ☐ HS400

Decode settings
☒ CMD Decoding
☒ Data Decoding

Decoding format
Transformat: 1 Bit Bus SDR
Block length setting
512 Byte

Pin Assignment
CLK: A0 D5: A2
CMD Line: A1
D0: A2 D4: A6
D1: A3 D5: A7
D2: A4 D6: A8
D3: A5 D7: A9
☐ Enable Hardware Reset RST_n: A10

Setting...
Default Back Next Cancel

STEP 6. Set the Pin Assignment.

This screenshot is identical to the one in Step 5, showing the 'PROTOCOL ANALYZER eMMC' dialog box. In this step, the 'Pin Assignment' section, which is highlighted with a red rectangle, is the focus. It shows the same pin assignments as in Step 5: CLK (A0), CMD Line (A1), D0 (A2), D1 (A3), D2 (A4), D3 (A5), D4 (A6), D5 (A7), D6 (A8), D7 (A9), and RST_n (A10). The 'Decoding format' section remains unchanged.

PROTOCOL ANALYZER eMMC

Mode setting
☒ Backwards compatibility ☐ High speed ☐ HS200 ☐ HS400

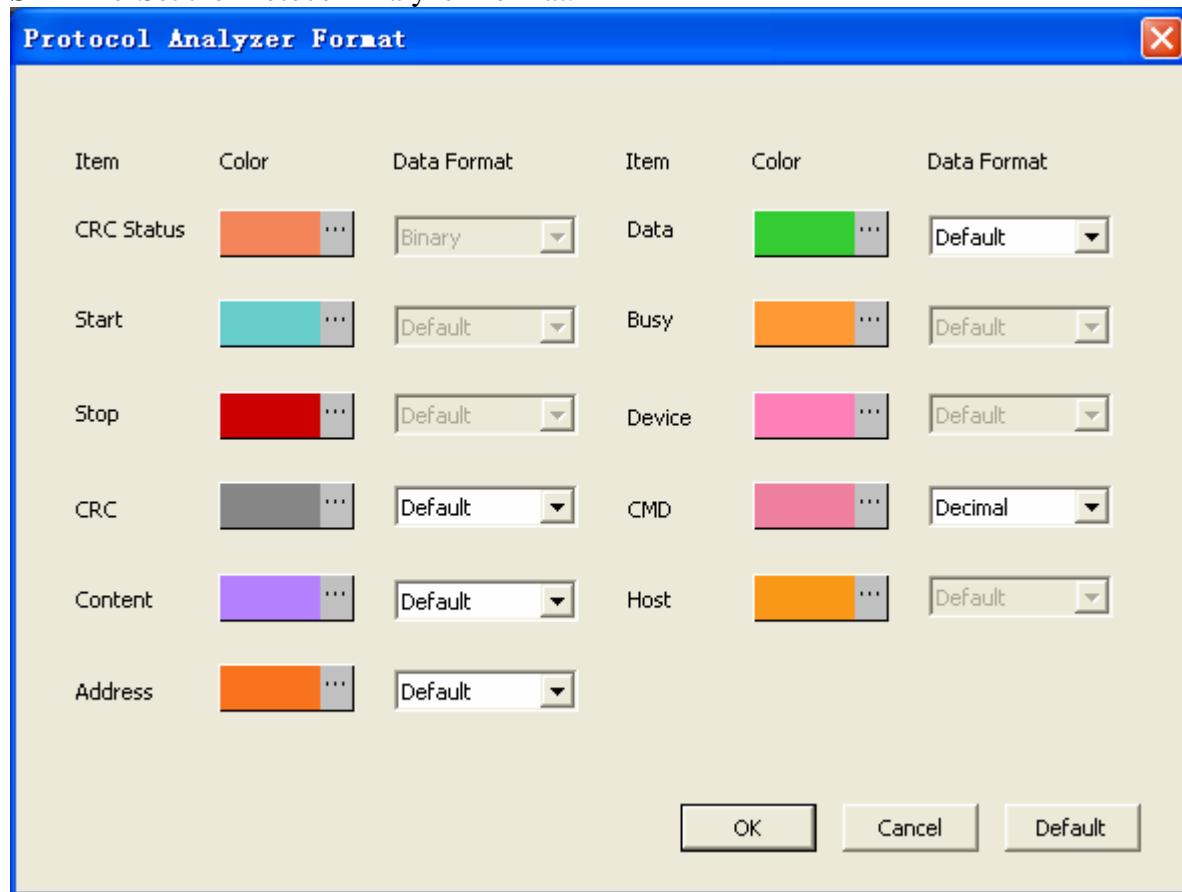
Decode settings
☒ CMD Decoding
☒ Data Decoding

Decoding format
Transformat: 1 Bit Bus SDR
Block length setting
512 Byte

Pin Assignment
CLK: A0 D5: A2
CMD Line: A1
D0: A2 D4: A6
D1: A3 D5: A7
D2: A4 D6: A8
D3: A5 D7: A9
☐ Enable Hardware Reset RST_n: A10

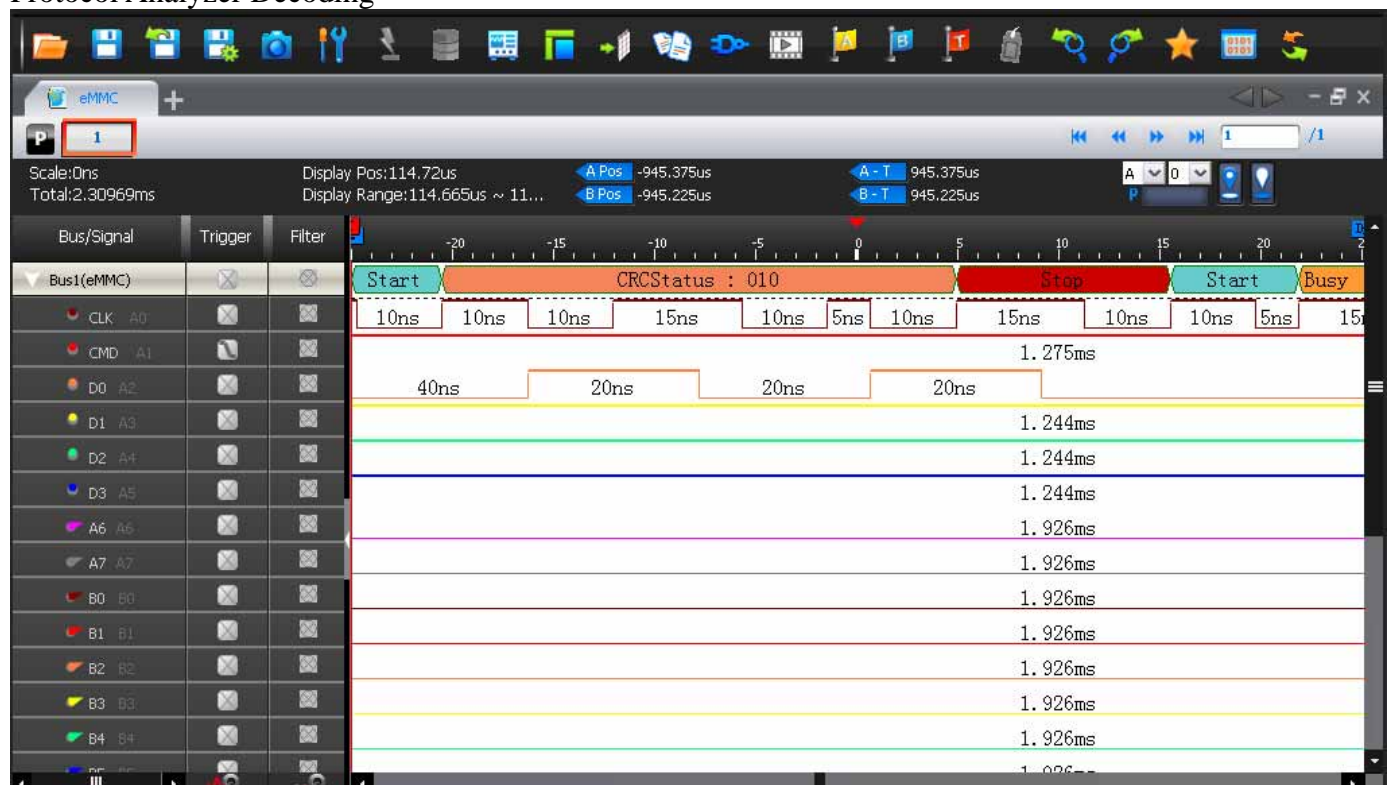
Setting...
Default Back Next Cancel

STEP 7. Set the Protocol Analyzer Format.



STEP 8. Following pictures show the completion of the protocol analyzer decoding and the packet list. The trigger condition is set as Falling Edge, the memory depth is 256K and the sampling frequency is 200MHz (the sampling frequency should be more than four times higher than the signal to be tested).

Protocol Analyzer Decoding



Packet List

Packet #	Name	TimeStamp	Start	Data															
1	Bus1(eMMC)	0.092905ms	Start	0XA4	0XC3	0X09	0XA2	0X91	0X82	0XA8	0X16	0XAC	0XC4	0X5A	0X62	0X5B	0XBD		
				Data															
				0XFE	0XA8	0XFE	0XCA	0XBB	0XFD	0X1E	0X25	0XE0	0X4E	0XD2	0X98	0X65	0XAF	0X5E	0XE4
				Data															
				0X0F	0X0D	0XEA	0XFB	0X7B	0XEE	0XCA	0X2E	0X4A	0XB8	0XFA	0X4B	0XD7	0XD7	0X7C	0XD9
				Data															
				0X01	0X2E	0X8C	0X3D	0XF2	0XFF	0XEE	0XD3	0X42	0XB6	0X30	0XA1	0XE0	0X40	0X44	0XF1
				Data															
				0XBB	0XBB	0XF0	0X17	0X04	0XFE	0XD8	0X21	0X4A	0X81	0X03	0X46	0X36	0X49	0X69	0X2D
				Data															

Navigator | Packet List | Statistics | Memory Analyzer | Auto test | Output