



孕龍科技股份有限公司
Zeroplus Technology Co., Ltd.

SPECIFICATION

MODEL: 013-LAP-S/PDIF-M

PART NO: _____

VERSION: V1.21

Approver		Check	Design
GM	PM		

Customer Confirm

*Please fax the file to Zeroplus Technology after signing.

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Content

1	Software Download	3
2	Software Installation	6
3	User Interface	10
4	Operating Instructions	11



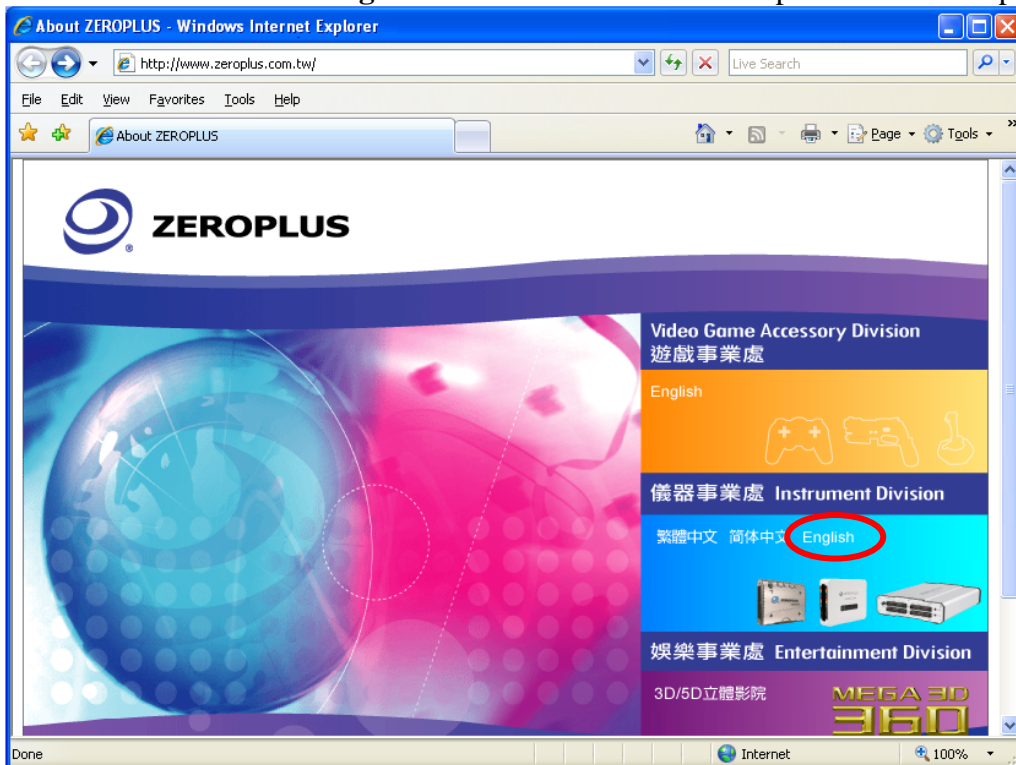
1 Software Download

Please install the software as the following steps:

Remark: We won't have additional notice for you, when there is any modification of the module specification. If there is some unconformity caused by the module version upgrade, users should take the module software as the standard.

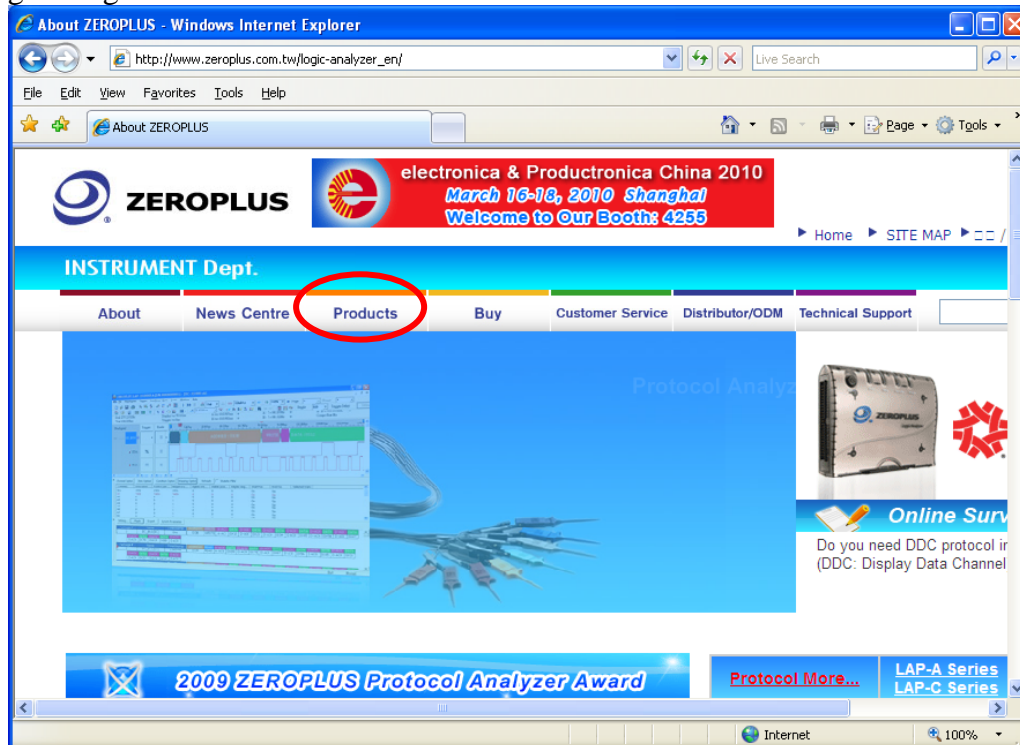
STEP 1. Visit the website of ZeroPlus: <http://www.zeroplus.com.tw>.

STEP 2. Click the **English** in the Instrument Division part on the Homepage.

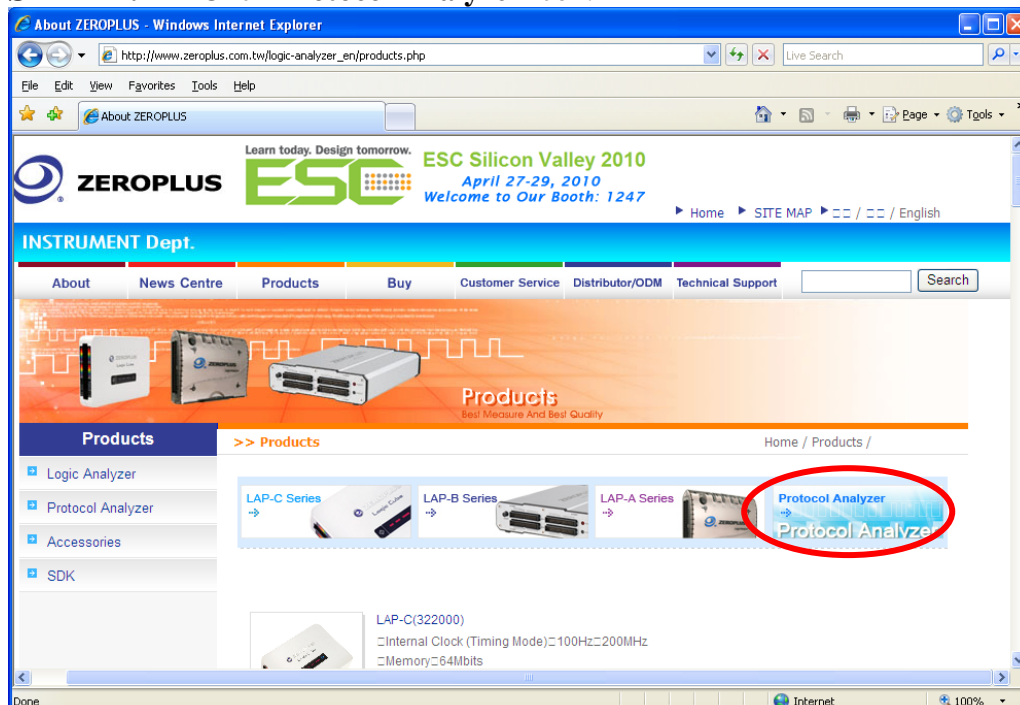




STEP 3. Click **Products** menu or select **Protocol Analyzer** item from its pull-down menu to go straight to STEP 5.

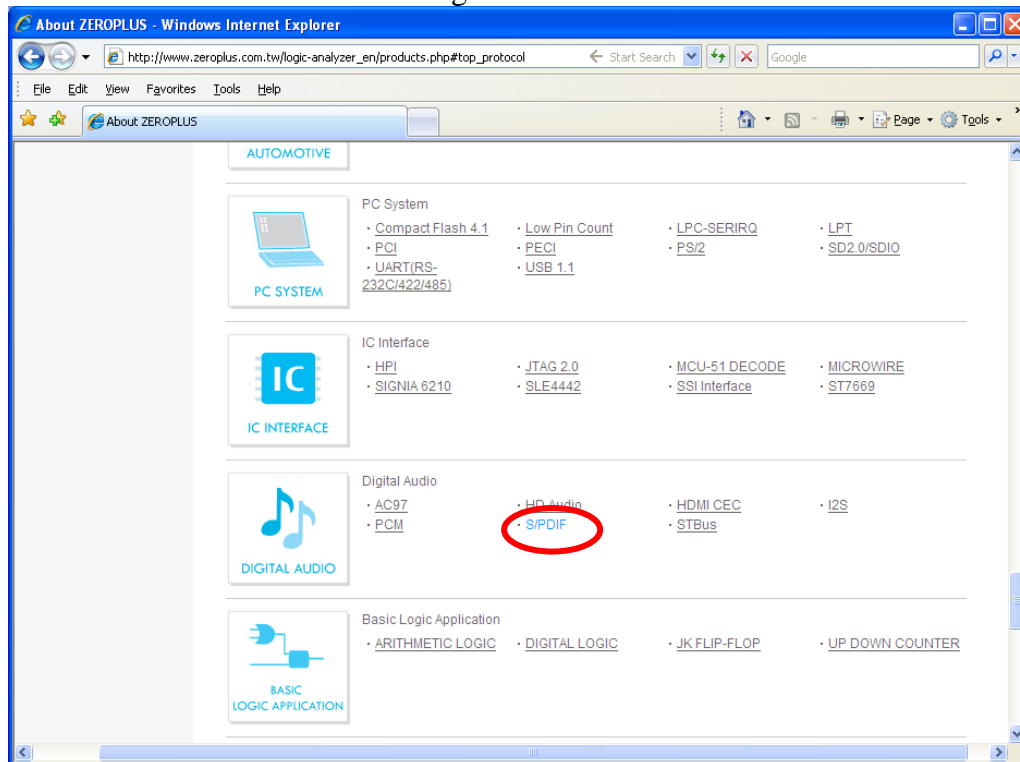


STEP 4. Click **Protocol Analyzer** icon.

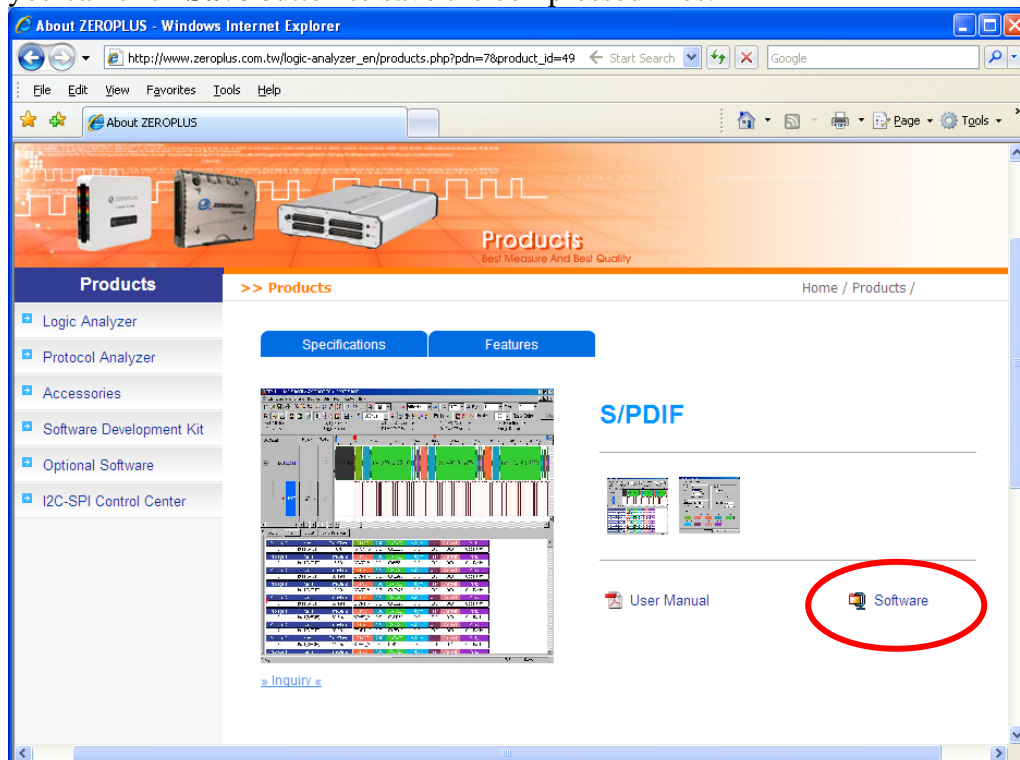




STEP 5. Click S/PDIF in Digital Audio.



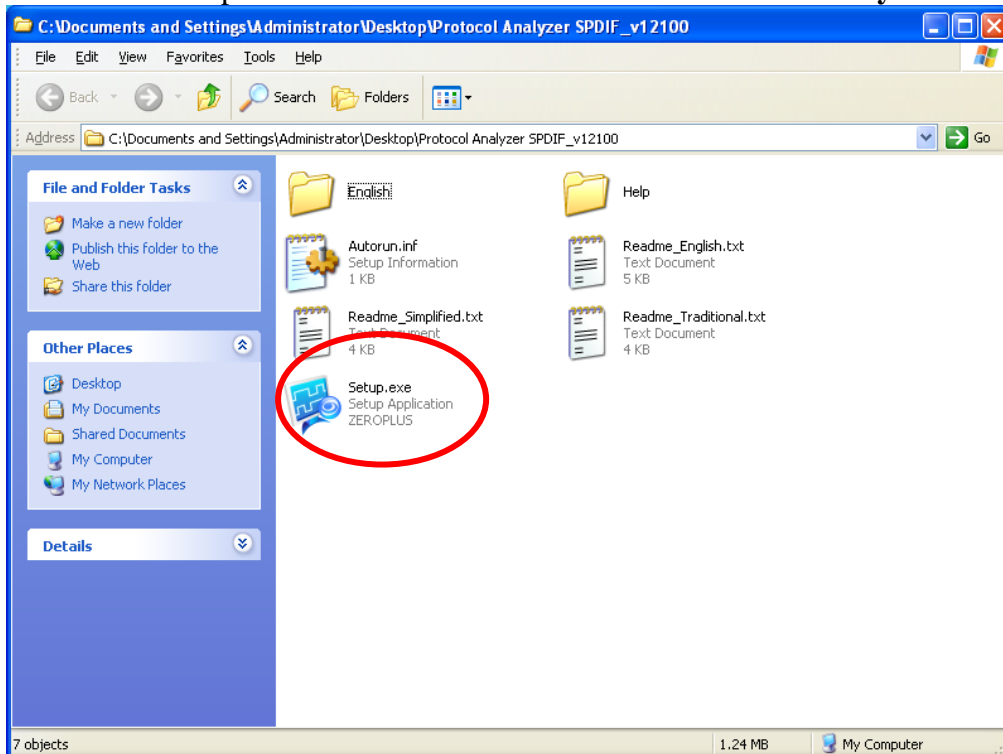
STEP 6. Click **Software** in the Products page. When the File Download dialog box appears, you can click **Save** button to save the compressed files.



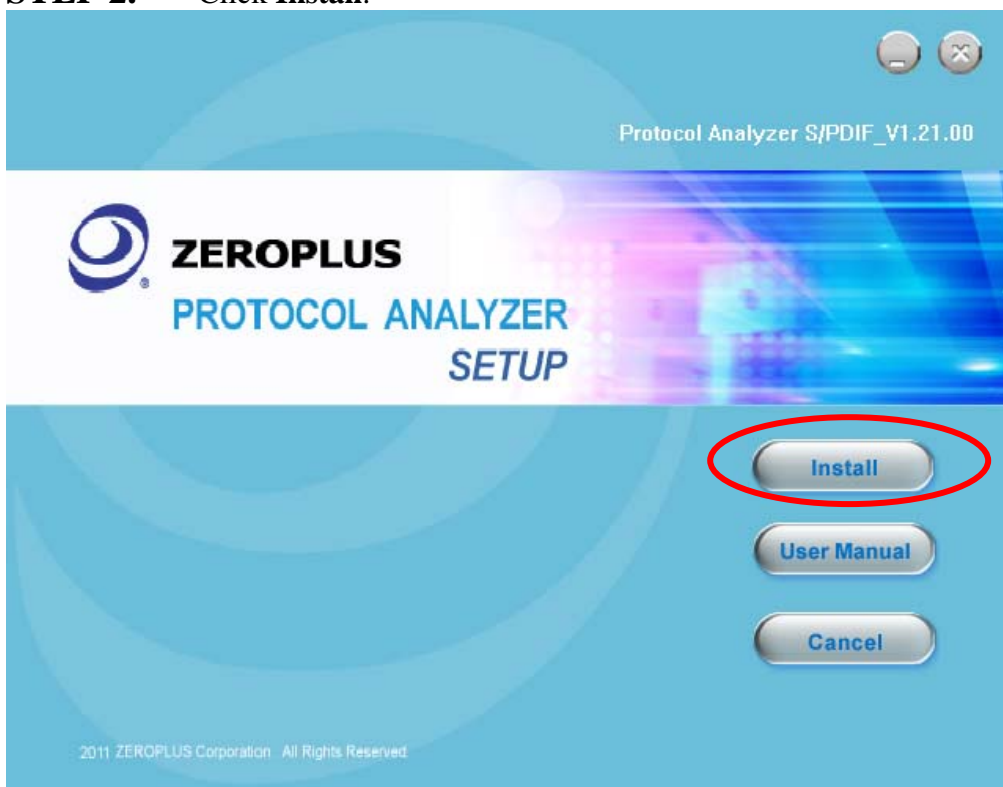


2 Software Installation

STEP 1. Open the downloaded folder to install **Protocol Analyzer S/PDIF**.

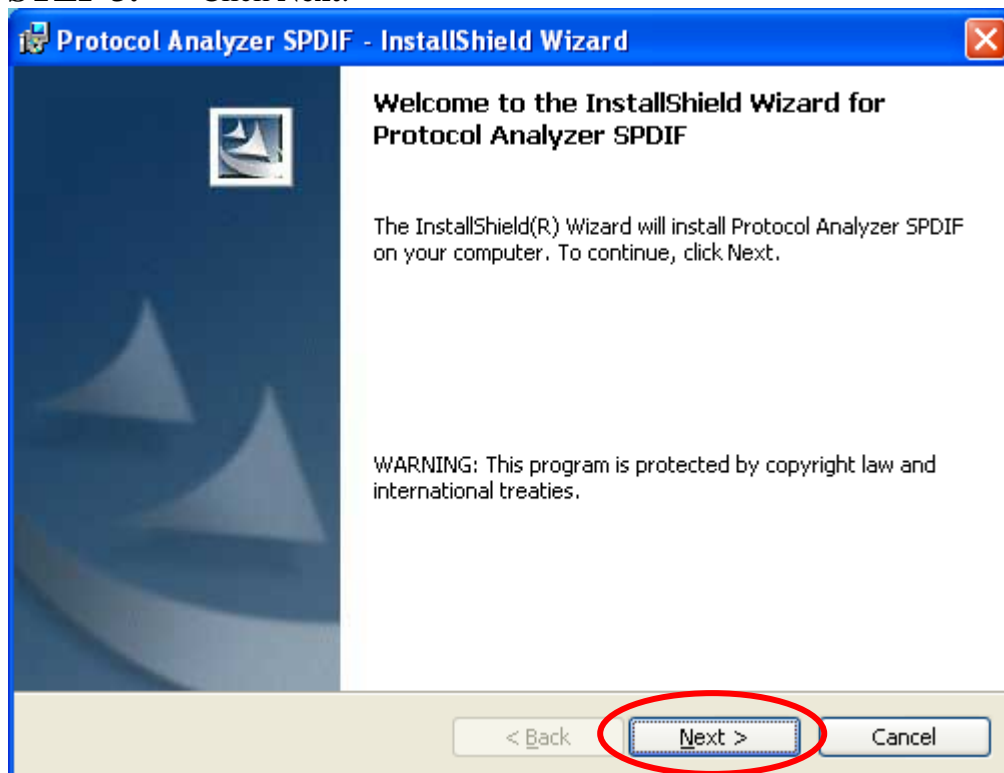


STEP 2. Click **Install**.

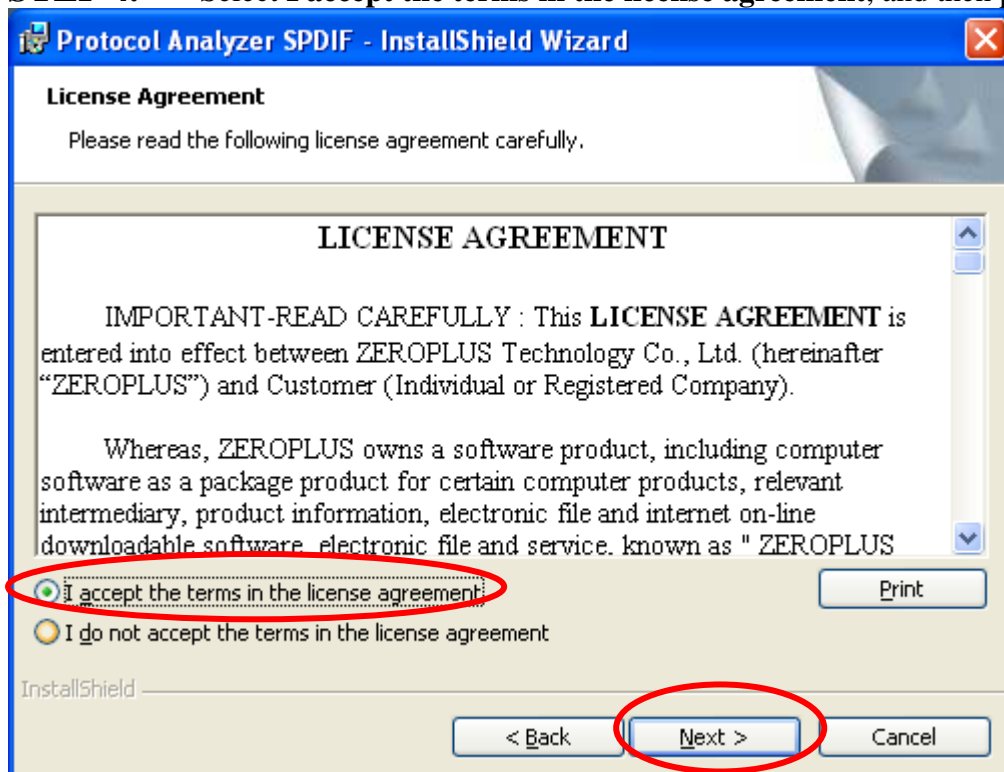




STEP 3. Click Next.



STEP 4. Select **I accept the terms in the license agreement**, and then press Next.





STEP 5. Fill in users' information in the below dialog box and click **Next**.

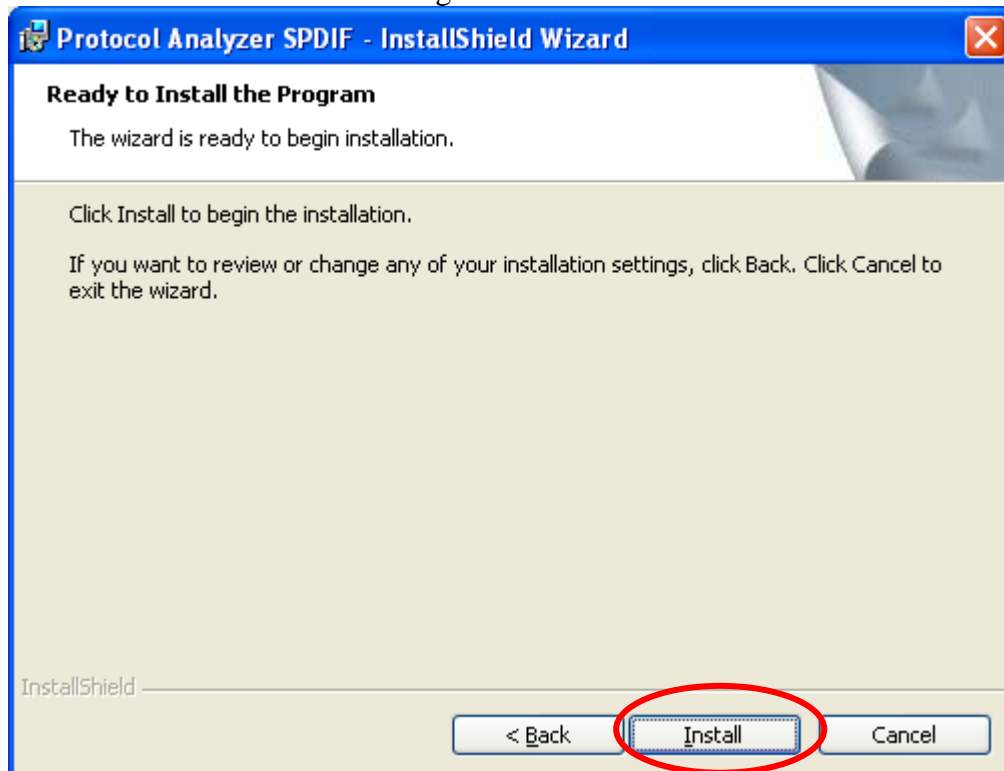
The dialog box is titled "Protocol Analyzer SPDIF - InstallShield Wizard". It has a blue header bar with a close button (X) in the top right corner. The main area is titled "Customer Information" and contains the text "Please enter your information." Below this, there are two text input fields: "User Name:" with "Microsoft" entered, and "Organization:" with "User" entered. Below the input fields, there is a section titled "Install this application for:" with two radio button options: "Anyone who uses this computer (all users)" (which is selected) and "Only for me (Microsoft)". At the bottom of the dialog, there are three buttons: "< Back", "Next >" (which is circled in red), and "Cancel". The "InstallShield" logo is visible in the bottom left corner.

STEP 6. Select **Complete** and then click **Next**.

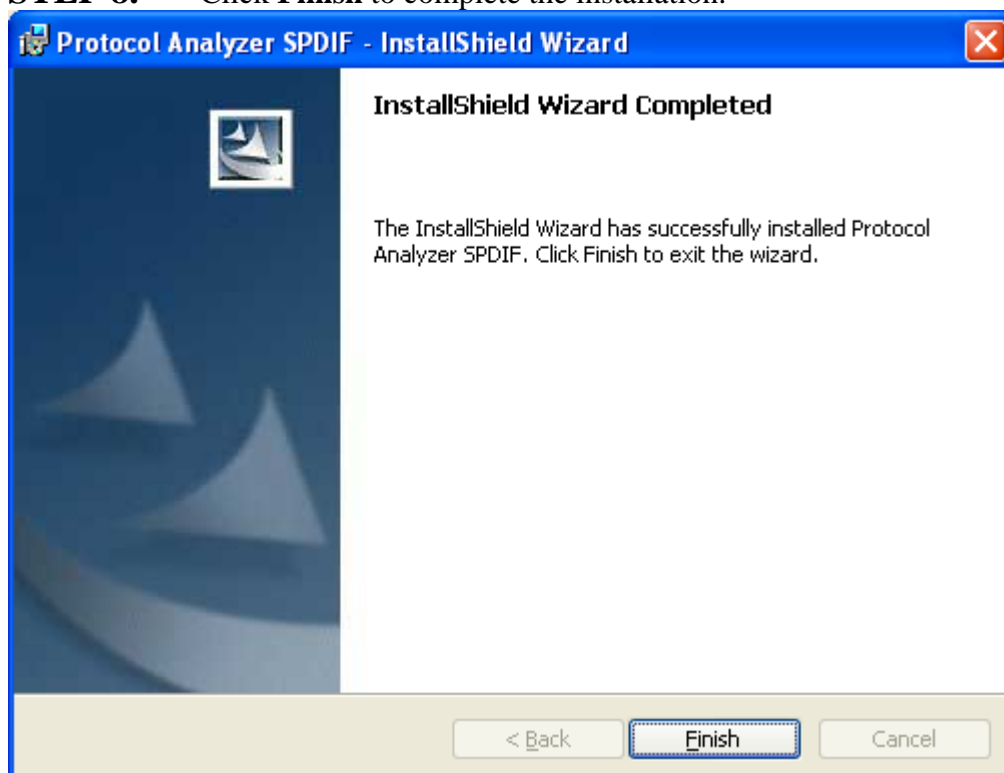
The dialog box is titled "Protocol Analyzer SPDIF - InstallShield Wizard". It has a blue header bar with a close button (X) in the top right corner. The main area is titled "Setup Type" and contains the text "Choose the setup type that best suits your needs." Below this, there is a section titled "Please select a setup type." with two radio button options: "Complete" (which is selected) and "Custom". Each option has a small icon of a computer with a red checkmark. The "Complete" option has the text "All program features will be installed. (Requires the most disk space.)" and the "Custom" option has the text "Choose which program features you want installed and where they will be installed. Recommended for advanced users." At the bottom of the dialog, there are three buttons: "< Back", "Next >" (which is circled in red), and "Cancel". The "InstallShield" logo is visible in the bottom left corner.



STEP 7. Click **Install** to begin the installation.



STEP 8. Click **Finish** to complete the installation.





3 User Interface

In the configuration, please refer to below images to select options of setting **S/PDIF**.

S/PDIF Configuration Dialog Box

Item	Color	Data Format
Start-B		Default
Start-W		Default
Start-M		Default
AUX		Default
Data		Default

Item	Color	Data Format
Validity		Default
User		Default
Channel		Default
Parity		Default

Pin Assignment:

S/PDIF only needs one channel to decode the signals, and the default is A0.

Protocol Analyzer Property:

AUX Transmission Direction: Set the Direction to LSB->MSB or MSB->LSB, the default is LSB->MSB.

Data Transmission Direction: Set the Direction to LSB->MSB or MSB->LSB, the default is LSB->MSB.

Frequency: Set the Frequency to 2.8224MHz, 3.0720MHz or 2.0480MHz, or enter a number in the range from 0.5MHz to 5MHz.

Data Mode: Set the Mode to 24-Bit, 20-Bit or 16-Bit, the default is 24-Bit.

Parity Check: Set the Parity Check to Odd Parity or Even Parity, the default is Odd Parity.

Frame Bit Length:

When the function is activated, the signals will be decoded strictly according to BLOCK format protocol; when the function is not activated, the signals which accord with the Sumframe format will be decoded. Generally, the range of BLOCK is from 32 to 192 Frames, and the default is 192 when the function is activated.

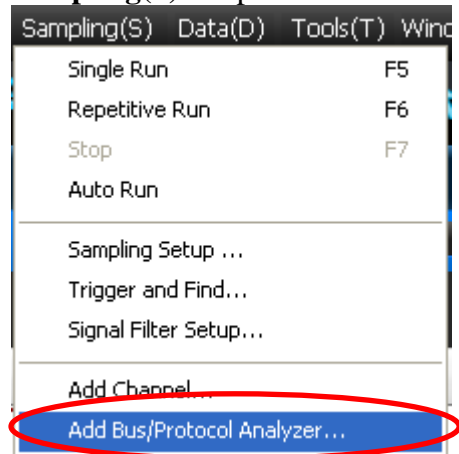
Protocol Analyzer Format:

The Color of each Item can be varied as the users' requirements. The Items (AUX and Data) can be set as Binary, Decimal, Hexadecimal, ASCII or Default. And the Data Format of these Items (AUX and Data) 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 Formats of these items (AUX and Data) is the Default.

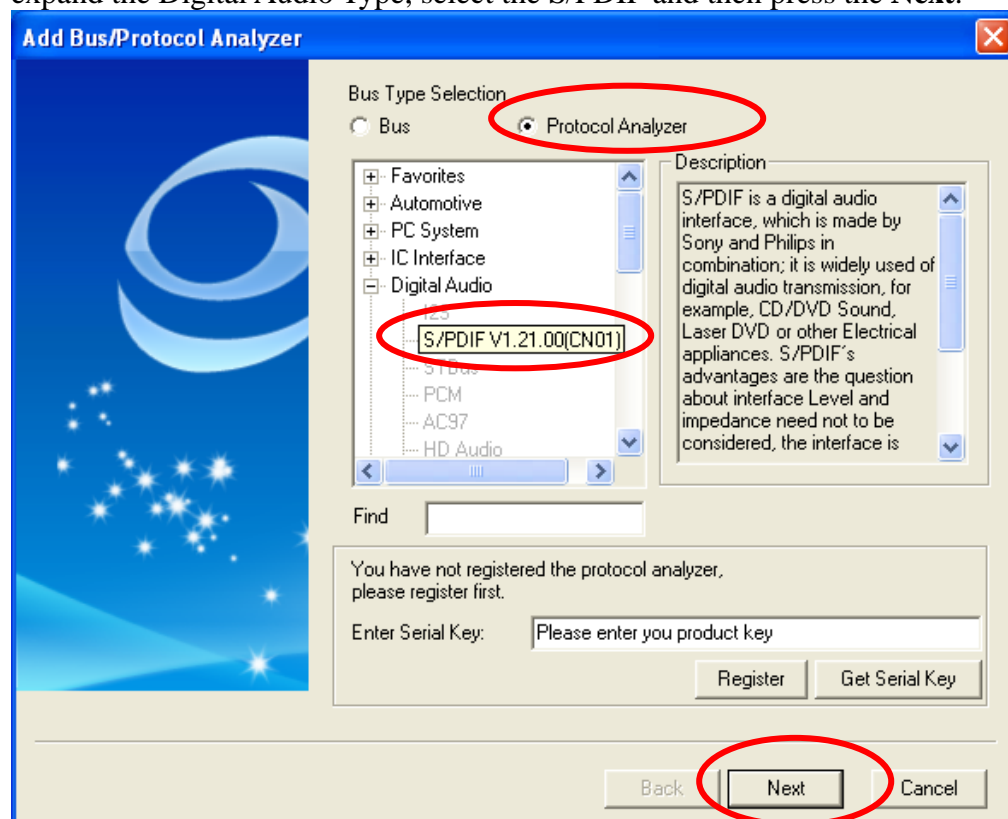


4 Operating Instructions

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

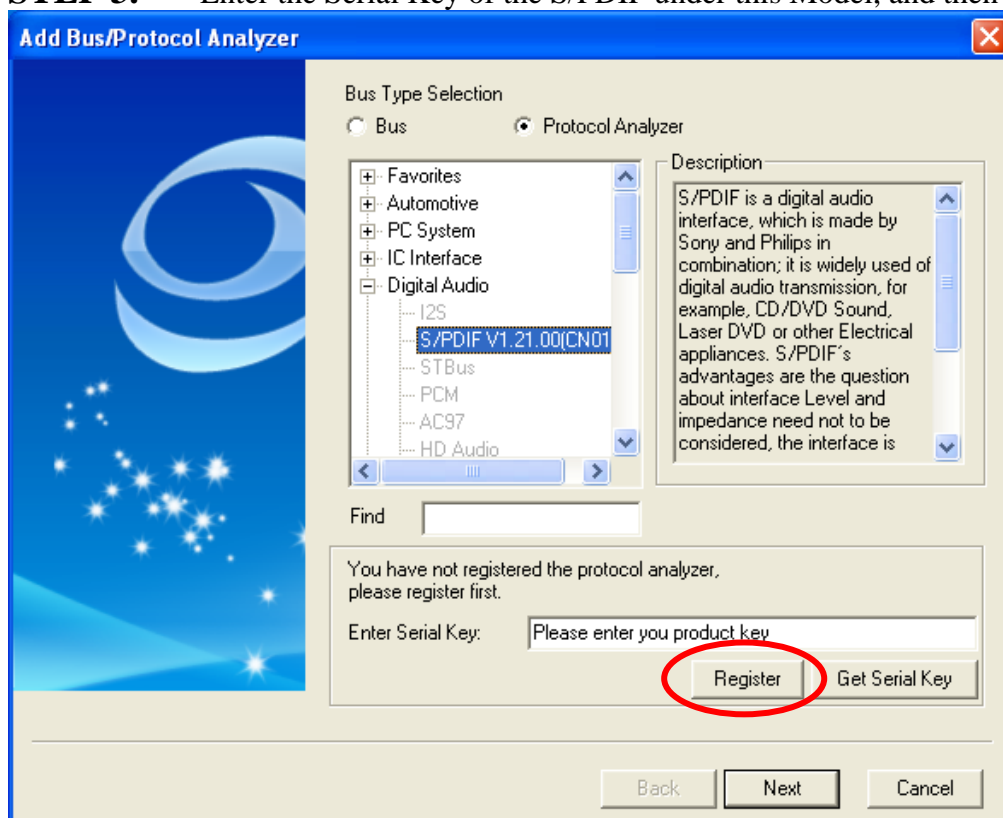


STEP 2. Select the Protocol Analyzer item in the Add Bus/Protocol Analyzer dialog box, expand the Digital Audio Type, select the S/PDIF and then press the **Next**.

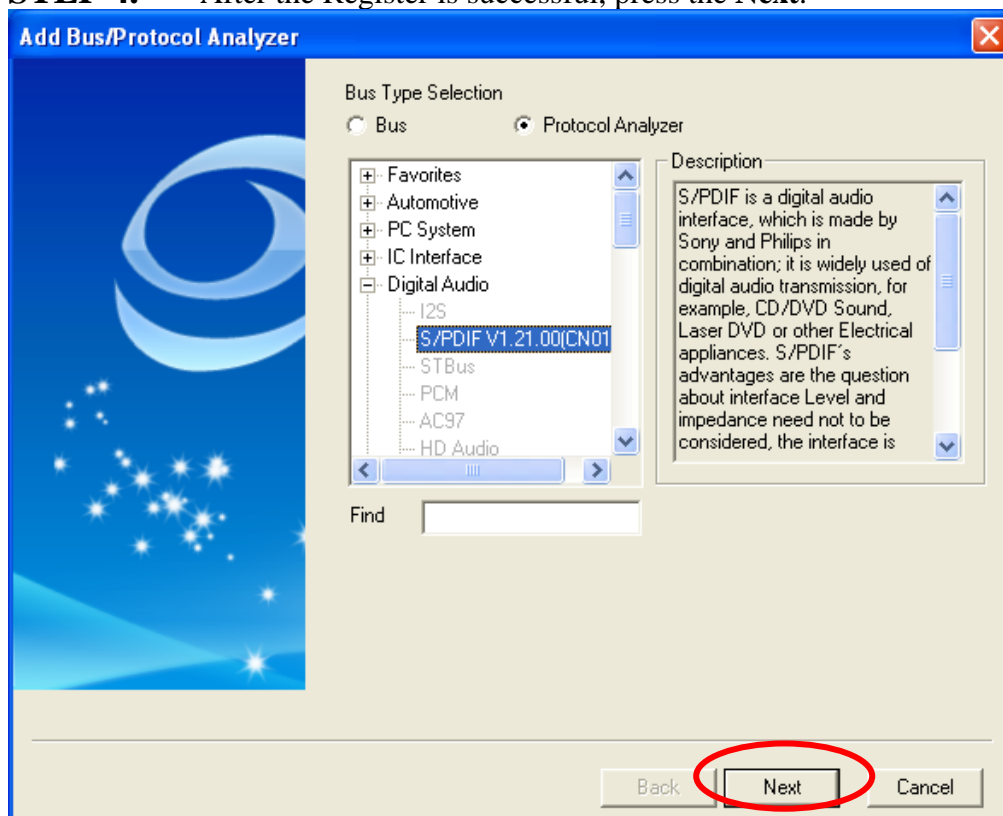




STEP 3. Enter the Serial Key of the S/PDIF under this Model, and then press the **Register**.



STEP 4. After the Register is successful, press the **Next**.





STEP 5. Open the PROTOCOL ANALYZER S/PDIF dialog box and set the channel for S/PDIF in the Pin Assignment.

PROTOCOL ANALYZER S/PDIF

Pin Assignment
S/PDIF: A0

Protocol Analyzer Property
AUX Transmission Direction: LSB->MSB Data Mode: 24-Bit
Data Transmission Direction: LSB->MSB Parity Check: Odd Parity
Frequency: 2.8224 MHz (Min:0.5MHz,Max:5MHz) Frame Bit Length: 192 (Min:32,Max:192)

Protocol Analyzer Format

Item	Color	Data Format	Item	Color	Data Format
Start-B	Green	Default	Validity	Blue	Default
Start-W	Red	Default	User	Purple	Default
Start-M	Orange	Default	Channel	Pink	Default
AUX	Light Blue	Default	Parity	Purple	Default
Data	Green	Default			

Default Back Next Cancel

STEP 6. Set the AUX Transmission Direction to LSB->MSB or MSB->LSB.

PROTOCOL ANALYZER S/PDIF

Pin Assignment
S/PDIF: A0

Protocol Analyzer Property
AUX Transmission Direction: LSB->MSB Data Mode: 24-Bit
Data Transmission Direction: LSB->MSB Parity Check: Odd Parity
Frequency: 2.8224 MHz (Min:0.5MHz,Max:5MHz) Frame Bit Length: 192 (Min:32,Max:192)

Protocol Analyzer Format

Item	Color	Data Format	Item	Color	Data Format
Start-B	Green	Default	Validity	Blue	Default
Start-W	Red	Default	User	Purple	Default
Start-M	Orange	Default	Channel	Pink	Default
AUX	Light Blue	Default	Parity	Purple	Default
Data	Green	Default			

Default Back Next Cancel



STEP 7. Set the **Data Transmission Direction** to LSB->MSB or MSB->LSB.

PROTOCOL ANALYZER S/PDIF

Pin Assignment
S/PDIF: A0

Protocol Analyzer Property
AUX Transmission Direction: LSB->MSB
Data Transmission Direction: LSB->MSB
Frequency: 2.8224 MHz (Min:0.5MHz,Max:5MHz)
Data Mode: 24-Bit
Parity Check: Odd Parity
☐ Frame Bit Length: 192 (Min:32,Max:192)

Protocol Analyzer Format

Item	Color	Data Format	Item	Color	Data Format
Start-B	Green	Default	Validity	Blue	Default
Start-W	Red	Default	User	Purple	Default
Start-M	Orange	Default	Channel	Pink	Default
AUX	Light Blue	Default	Parity	Purple	Default
Data	Green	Default			

Default Back Next Cancel

STEP 8. Set the **Frequency** in the range from 0.5MHz to 5MHz.

PROTOCOL ANALYZER S/PDIF

Pin Assignment
S/PDIF: A0

Protocol Analyzer Property
AUX Transmission Direction: LSB->MSB
Data Transmission Direction: LSB->MSB
Frequency: 2.8224 MHz (Min:0.5MHz,Max:5MHz)
Data Mode: 24-Bit
Parity Check: Odd Parity
☐ Frame Bit Length: 192 (Min:32,Max:192)

Protocol Analyzer Format

Item	Color	Data Format	Item	Color	Data Format
Start-B	Green	Default	Validity	Blue	Default
Start-W	Red	Default	User	Purple	Default
Start-M	Orange	Default	Channel	Pink	Default
AUX	Light Blue	Default	Parity	Purple	Default
Data	Green	Default			

Default Back Next Cancel



STEP 9. Set the **Data Mode** to 24-Bit, 20-Bit or 16-Bit.

PROTOCOL ANALYZER S/PDIF

Pin Assignment
S/PDIF: A0

Protocol Analyzer Property
AUX Transmission Direction: LSB->MSB
Data Transmission Direction: LSB->MSB
Frequency: 2.8224 MHz (Min:0.5MHz,Max:5MHz)
Parity Check: Odd Parity
Data Mode: 24-Bit
Frame Bit Length: 192 (Min:32,Max:192)

Protocol Analyzer Format

Item	Color	Data Format	Item	Color	Data Format
Start-B	Green	Default	Validity	Blue	Default
Start-W	Red	Default	User	Purple	Default
Start-M	Orange	Default	Channel	Pink	Default
AUX	Light Blue	Default	Parity	Purple	Default
Data	Light Green	Default			

Default Back Next Cancel

STEP 10. Set the **Parity Check** to Odd Parity or Even Parity.

PROTOCOL ANALYZER S/PDIF

Pin Assignment
S/PDIF: A0

Protocol Analyzer Property
AUX Transmission Direction: LSB->MSB
Data Transmission Direction: LSB->MSB
Frequency: 2.8224 MHz (Min:0.5MHz,Max:5MHz)
Parity Check: Odd Parity
Data Mode: 24-Bit
Frame Bit Length: 192 (Min:32,Max:192)

Protocol Analyzer Format

Item	Color	Data Format	Item	Color	Data Format
Start-B	Green	Default	Validity	Blue	Default
Start-W	Red	Default	User	Purple	Default
Start-M	Orange	Default	Channel	Pink	Default
AUX	Light Blue	Default	Parity	Purple	Default
Data	Light Green	Default			

Default Back Next Cancel



STEP 11. Set the Frame Bit Length.

PROTOCOL ANALYZER S/PDIF

Pin Assignment
S/PDIF: A0

Protocol Analyzer Property
AUX Transmission Direction: LSB->MSB
Data Transmission Direction: LSB->MSB
Frequency: 2.8224 MHz (Min:0.5MHz,Max:5MHz)
Data Mode: 24-Bit
Parity Check: Odd Parity
☒ Frame Bit Length: 192 (Min:32,Max:192)

Protocol Analyzer Format

Item	Color	Data Format	Item	Color	Data Format
Start-B	Green	Default	Validity	Blue	Default
Start-W	Red	Default	User	Purple	Default
Start-M	Orange	Default	Channel	Pink	Default
AUX	Light Blue	Default	Parity	Dark Purple	Default
Data	Light Green	Default			

Default Back Next Cancel

STEP 12. Set the Color of each Item and the Data Format of the Items (AUX and Data).

PROTOCOL ANALYZER S/PDIF

Pin Assignment
S/PDIF: A0

Protocol Analyzer Property
AUX Transmission Direction: LSB->MSB
Data Transmission Direction: LSB->MSB
Frequency: 2.8224 MHz (Min:0.5MHz,Max:5MHz)
Data Mode: 24-Bit
Parity Check: Odd Parity
☒ Frame Bit Length: 192 (Min:32,Max:192)

Protocol Analyzer Format

Item	Color	Data Format	Item	Color	Data Format
Start-B	Green	Default	Validity	Blue	Default
Start-W	Red	Default	User	Purple	Default
Start-M	Orange	Default	Channel	Pink	Default
AUX	Light Blue	Default	Parity	Dark Purple	Default
Data	Light Green	Default			

Default Back Next Cancel



STEP 13. Press the **Next** to finish all settings.

The screenshot shows the 'PROTOCOL ANALYZER S/PDIF' dialog box. It has three main sections: 'Pin Assignment', 'Protocol Analyzer Property', and 'Protocol Analyzer Format'. The 'Pin Assignment' section has a dropdown for 'S/PDIF' set to 'A0'. The 'Protocol Analyzer Property' section has several dropdowns: 'AUX Transmission Direction' (LSB->MSB), 'Data Transmission Direction' (LSB->MSB), 'Frequency' (2.8224 MHz), 'Data Mode' (24-Bit), 'Parity Check' (Odd Parity), and 'Frame Bit Length' (192). The 'Protocol Analyzer Format' section has two columns of items with color and data format settings. At the bottom, there are four buttons: 'Default', 'Back', 'Next', and 'Cancel'. The 'Next' button is circled in red.

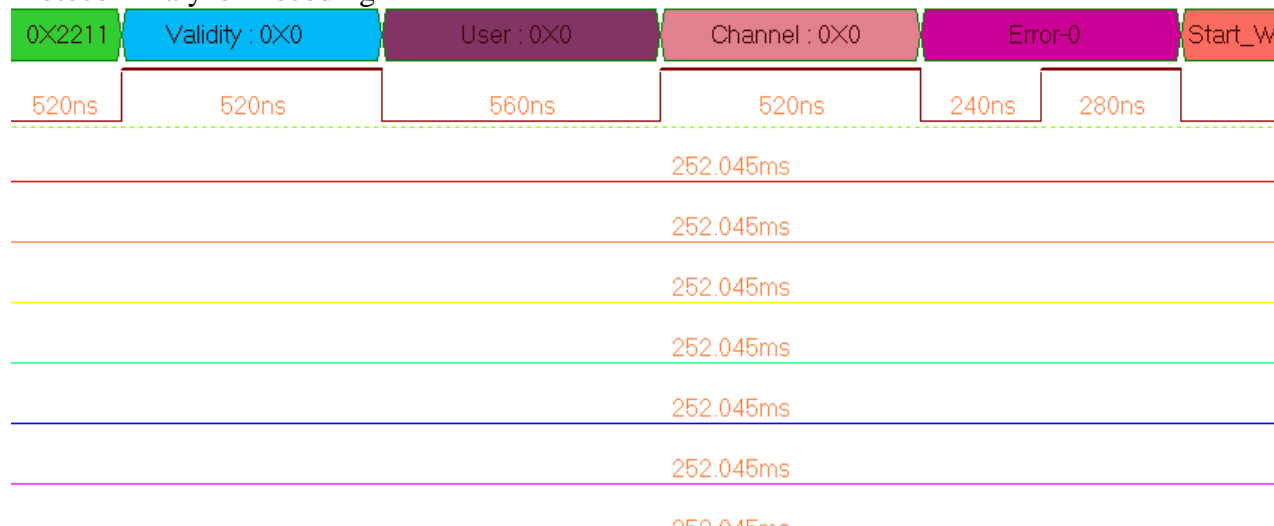
STEP 14. Please enter the Bus Name, select **Yes, please delete** or **No, please reserve** and then press **Finish**.

The screenshot shows the 'Add Bus/Protocol Analyzer' dialog box. It has a text input field for 'Please input the Bus name' with the value 'BUS'. Below it, there is a question: 'Do you want to delete the other Buses and channels in the software?'. There are two radio buttons: 'Yes, please delete' and 'No, please reserve'. The 'No, please reserve' radio button is selected and circled in red. At the bottom, there are three buttons: 'Back', 'Finish', and 'Cancel'. The 'Finish' button is circled in red.



STEP 15. Following pictures show the completion of the protocol analyzer decoding and the packet list. The trigger condition is Either Edge; the memory depth is 32K; the sampling frequency is 25MHz (the sampling frequency should be more than four times higher than the signal to be tested).

Protocol Analyzer Decoding



Packet List

Navigator Packet List Statistics Memory Analyzer									
Setting... Refresh Export... Synch. Parameter...									
Packet #	Name	TimeStamp	Start_B	AUX	Data16	Validity	User	Channel	Parity
1	Bus1(S/PDIF)	0ms	Start_B	Invalid Data	2211	0	0	0	Odd Parity
Packet #	Name	TimeStamp	Start_W	AUX	Data16	Validity	User	Channel	Parity
2	Bus1(S/PDIF)	0.01668ms	Start_W	Invalid Data	6655	0	0	0	Odd Parity
Packet #	Name	TimeStamp	Start_M	AUX	Data16	Validity	User	Channel	Parity
3	Bus1(S/PDIF)	0.03312ms	Start_M	Invalid Data	1299	0	0	0	Odd Parity
Packet #	Name	TimeStamp	Start_W	AUX	Data16	Validity	User	Channel	Parity
4	Bus1(S/PDIF)	0.04968ms	Start_W	Invalid Data	1367	0	0	0	Odd Parity
Packet #	Name	TimeStamp	Start_M	AUX	Data16	Validity	User	Channel	Parity
5	Bus1(S/PDIF)	0.06608ms	Start_M	Invalid Data	1312	0	0	0	Odd Parity
Packet #	Name	TimeStamp	Start_W	AUX	Data16	Validity	User	Channel	Parity
6	Bus1(S/PDIF)	0.08272ms	Start_W	Invalid Data	2423	0	0	0	Odd Parity
Packet #	Name	TimeStamp	Start_M	AUX	Data16	Validity	User	Channel	Parity
7	Bus1(S/PDIF)	0.09928ms	Start_M	Invalid Data	3534	0	0	0	Odd Parity
Packet #	Name	TimeStamp	Start_W	AUX	Data16	Validity	User	Channel	Parity
8	Bus1(S/PDIF)	0.1158ms	Start_W	Invalid Data	4645	0	1	1	Odd Parity
Packet #	Name	TimeStamp	Start_M	AUX	Data16	Validity	User	Channel	Parity
9	Bus1(S/PDIF)	0.13224ms	Start_M	Invalid Data	5756	0	1	1	Odd Parity
Packet #	Name	TimeStamp	Start_W	AUX	Data16	Validity	User	Channel	Parity
10	Bus1(S/PDIF)	0.14868ms	Start_W	Invalid Data	6867	0	0	0	Odd Parity