



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

SPECIFICATION

MODEL: B11009-KEELOQ Code Hopping

PART NO: _____

VERSION: V1.00

Approver		Check	Design
GM	PM		

Customer Confirm

*Please fax the file to ZeroPlus Technology after signing.

2F, NO.123, Jian Ba Rd,
Chung Ho City, Taipei Hsian, R.O.C.

Tel:+886-2-66202225
Fax:+886-2-22234362

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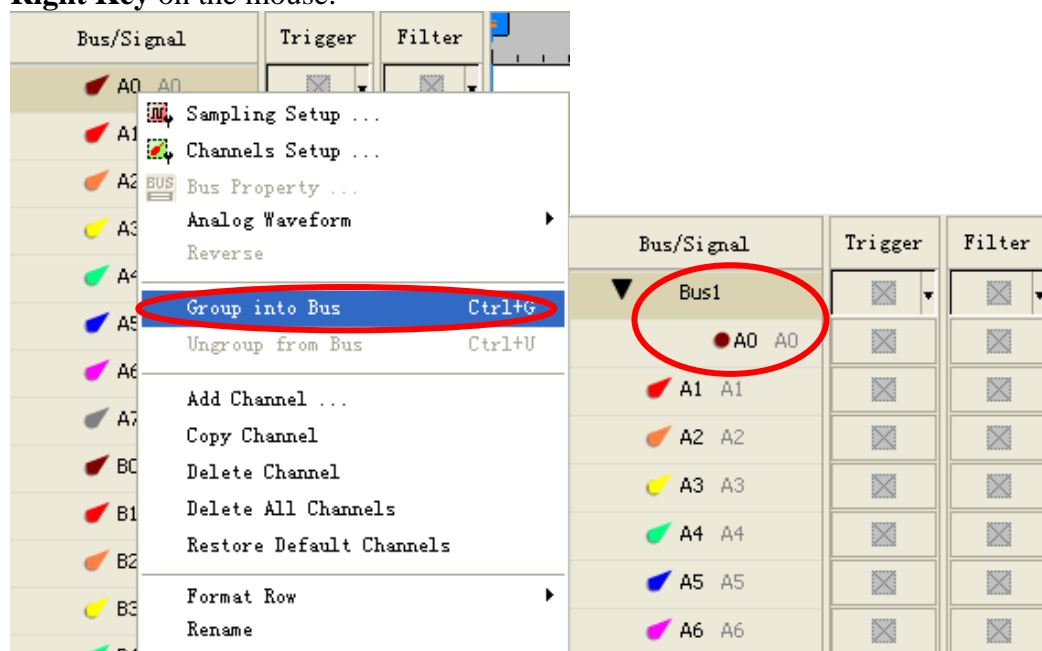
1. Software Register

Please register the software as the following steps:

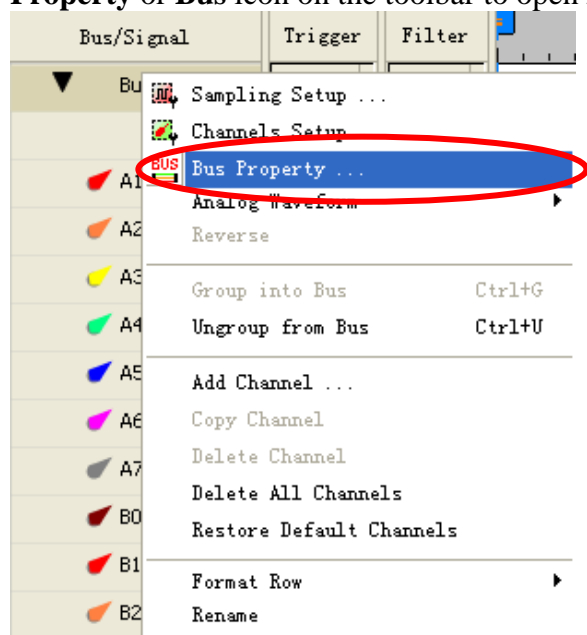
※ Remark1: The registration steps for all protocol analyzers are the same; you can complete the registration by following procedures. Following is an example on how to register the Protocol Analyzer BUS.

※ Remark2: 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.

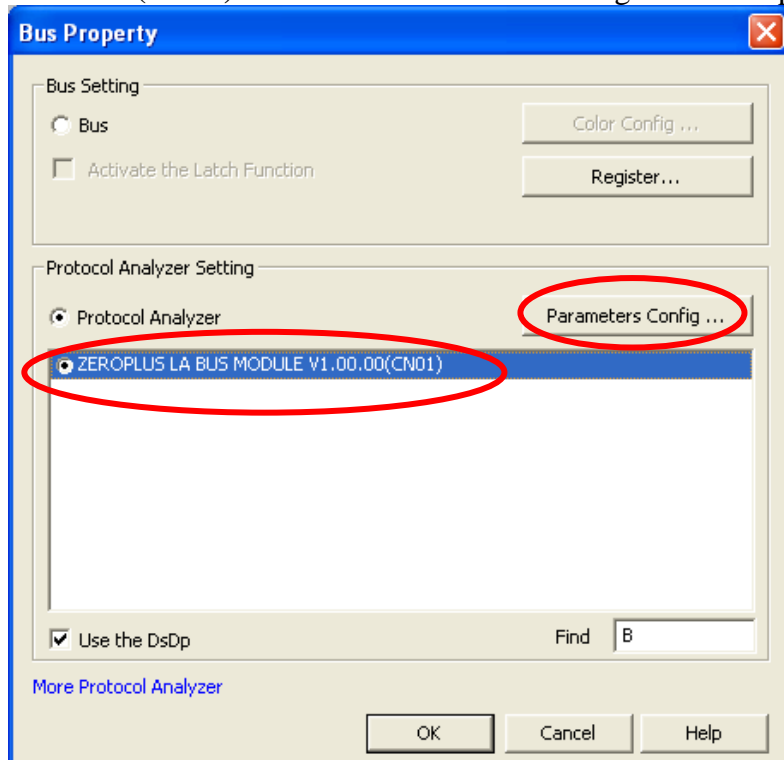
STEP 1. Open the Logic Analyzer and group the unanalyzed channels into **Bus1** by pressing the **Right Key** on the mouse.



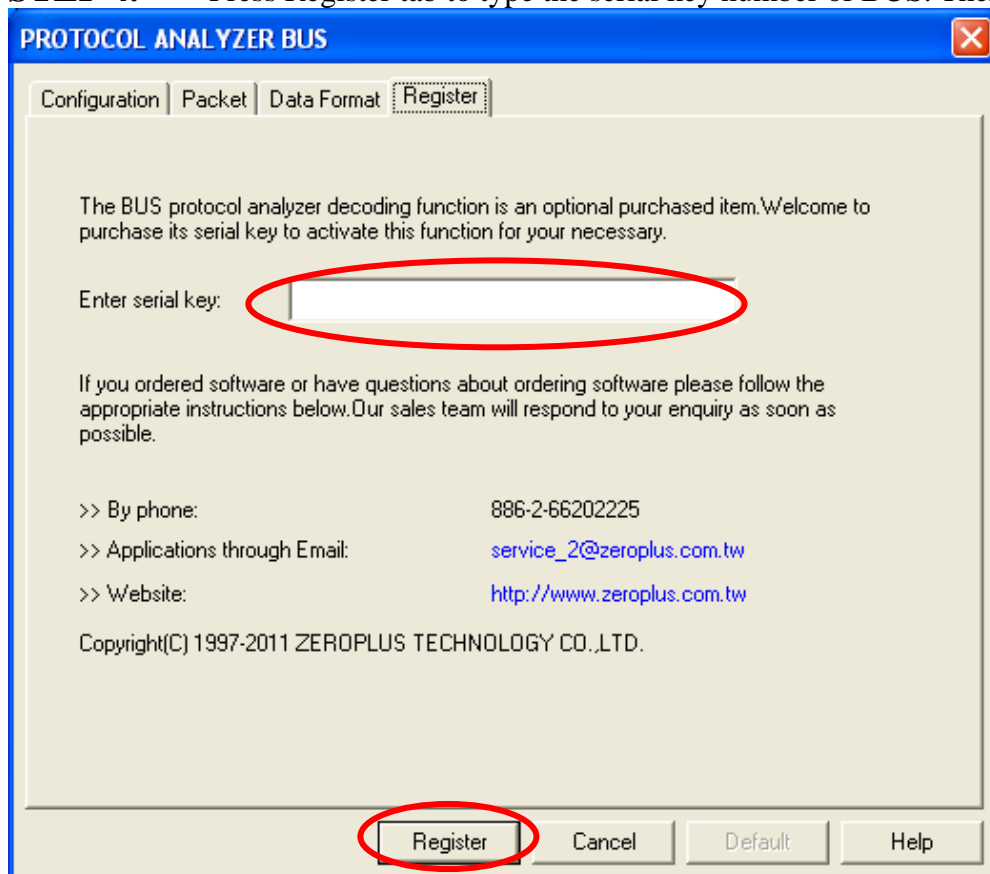
STEP 2. Select **Bus 1**, then press **Right Key** on the mouse to list the menu, then press **Bus Property** or **Bus** icon on the toolbar to open **Bus Property** dialog box.



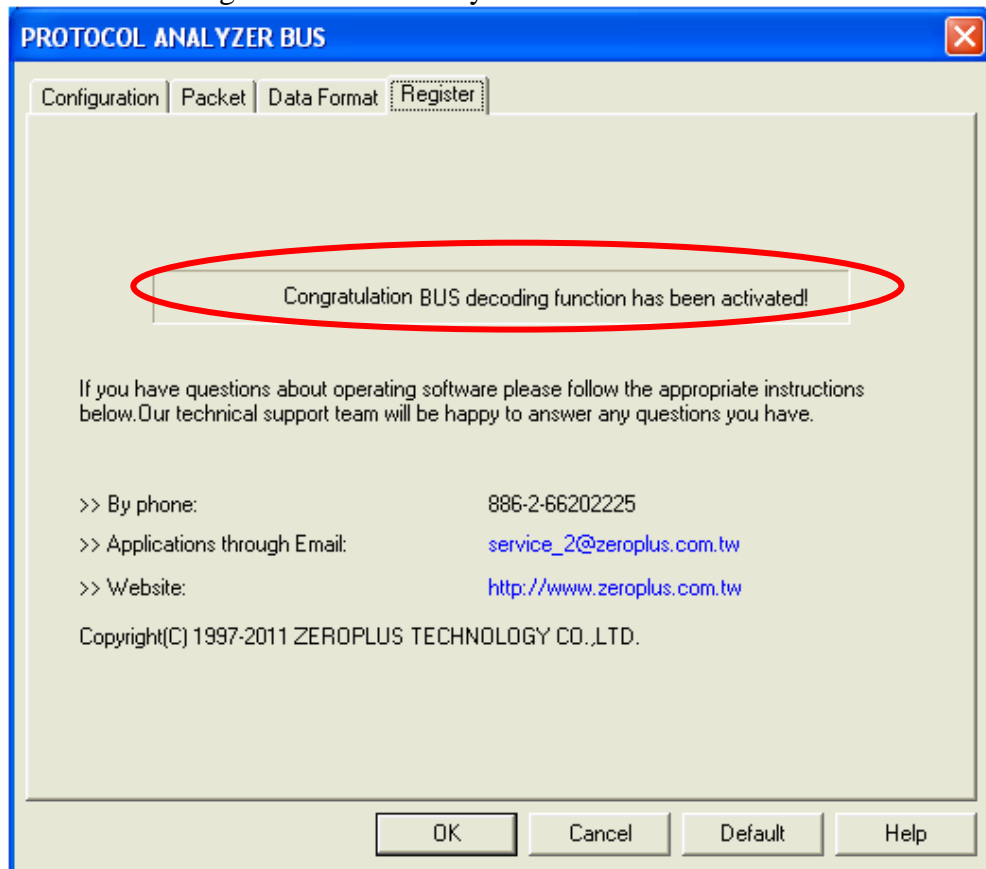
STEP 3. Select the Protocol Analyzer, and then choose **ZEROPLUS LA BUS MODULE V1.00.00 (CN01)**. Next click Parameters Configuration to open Protocol Analyzer Bus dialog box.



STEP 4. Press Register tab to type the serial key number of BUS. Then press Register.



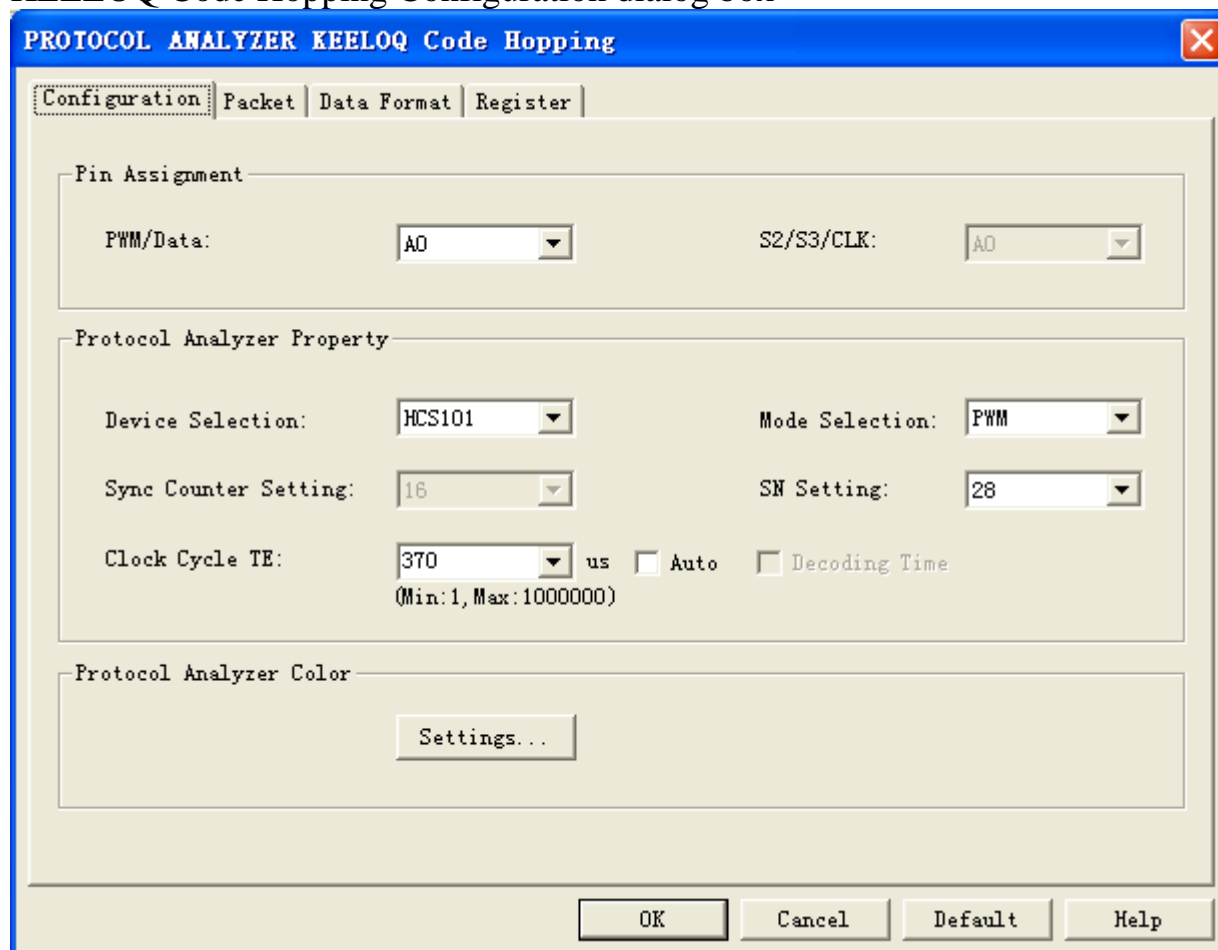
STEP 5. After pressing the Register button, following dialog box will appear, it denotes that the BUS has been registered successfully.



2. User Interface

Please refer to the below images to select options of setting KEELOQ Code Hopping **MODULE**.

KEELOQ Code Hopping Configuration dialog box



Pin Assignment: When selecting the PWM, VPWM, MANCH, PPM or Seed mode, it only needs one channel to decode signals; but if selecting the Sync or Writer mode, it needs two channels to decode and the S2/S3/CLK is activated; so the decoded Channel is related with the Mode Selection.

Protocol Analyzer Property:

Device Selection:

There are 12 kinds of Device Selection that are HCS10, HCS200, HCS201, HCS300, HCS301, HCS320, HCS360, HCS361, HCS362, HCS365, HCS370, HCS500.

Clock Cycle TE: When selecting the PWM, VPWM, MANCH, PPM or Seed mode(Single Channel), user needs to set the Clock Cycle TE. The TE Range is 1~1000000us, user can input and select the 100,200,370 or 400 from pull-down menu; the default is 370.

Decoding Time: It only can be activated in the HCS362 device. After selecting, the CRC can't be decoded, but the Time can be decoded.

Mode Selection and Other Settings Explanation: Different device can have the different selected mode (10 items in all).

HCS101: It only supports the PWM, the SN Settings is activated, and the Sync Counter Setting is disable.

HCS200: It supports the PWM/Sync/Writer, the SN Setting and the Sync Counter Setting are disable. It

doesn't support the Seed.

HCS201: It supports the PWM/Sync/Writer, the SN Setting and the Sync Counter Setting are disable.

When the Seed is decoded in Button Status=1111, the PWM/Sync mode may be appear.

HCS300/301: It supports the PWM/Sync/Writer, the SN Setting and the Sync Counter Setting are disable.

When the Seed is decoded in Button Status=1111, the PWM/Sync mode may be appear.

HCS320: It supports the PWM/Sync/Writer, the SN Setting and the Sync Counter Setting are disable. It doesn't support the Seed.

HCS360: It supports the PWM/MANCH/Writer/PWM Seed/MANCH Seed, the SN Setting and the Sync Counter Setting are disable. The Seed in HCS360 Device can be set as mode selection, it doesn't decided by the Button Status; the PWM/MANCH mode may be appear.

HCS361: It supports the PWM(TXWAK=0)/PWM(TXWAK=1)/VPWM/Writer/PWM(TXWAK=0) Seed/PWM(TXWAK=1) Seed/VPWM Seed, SN Setting is activated and Sync Counter Setting is disable. Seed in HCS361 Device can be set as mode selection, it doesn't decided by the Button Status; the PWM/VPWM mode may be appear.

HCS362: It supports the PWM/MANCH/Sync/Writer, SN Setting is activated, Sync Counter Setting is disable. When the Seed is decoded in Button Status=1111, the PWM/MANCH mode may be appear.

HCS365/370: It supports the PWM/MANCH/VPWM/PPM, the SN Setting and Sync Counter Setting are disable. When the Seed is decoded in Button Status=1111, the PWM/MANCH/VPWM/PPM mode may be appear.

HCS500: It only supports the PWM, the SN Setting and Sync Counter Setting are disable. It doesn't support the Seed decoding.

Sync Counter Setting: User can set to 16 or 20, the default is 16.

SN Setting: User can set to 28 or 32, the default is 28.

Auto: The Clock Cycle TE is the min unit of time in decoding, when selecting the Auto, the Clock Cycle TE can be calculated automatically.

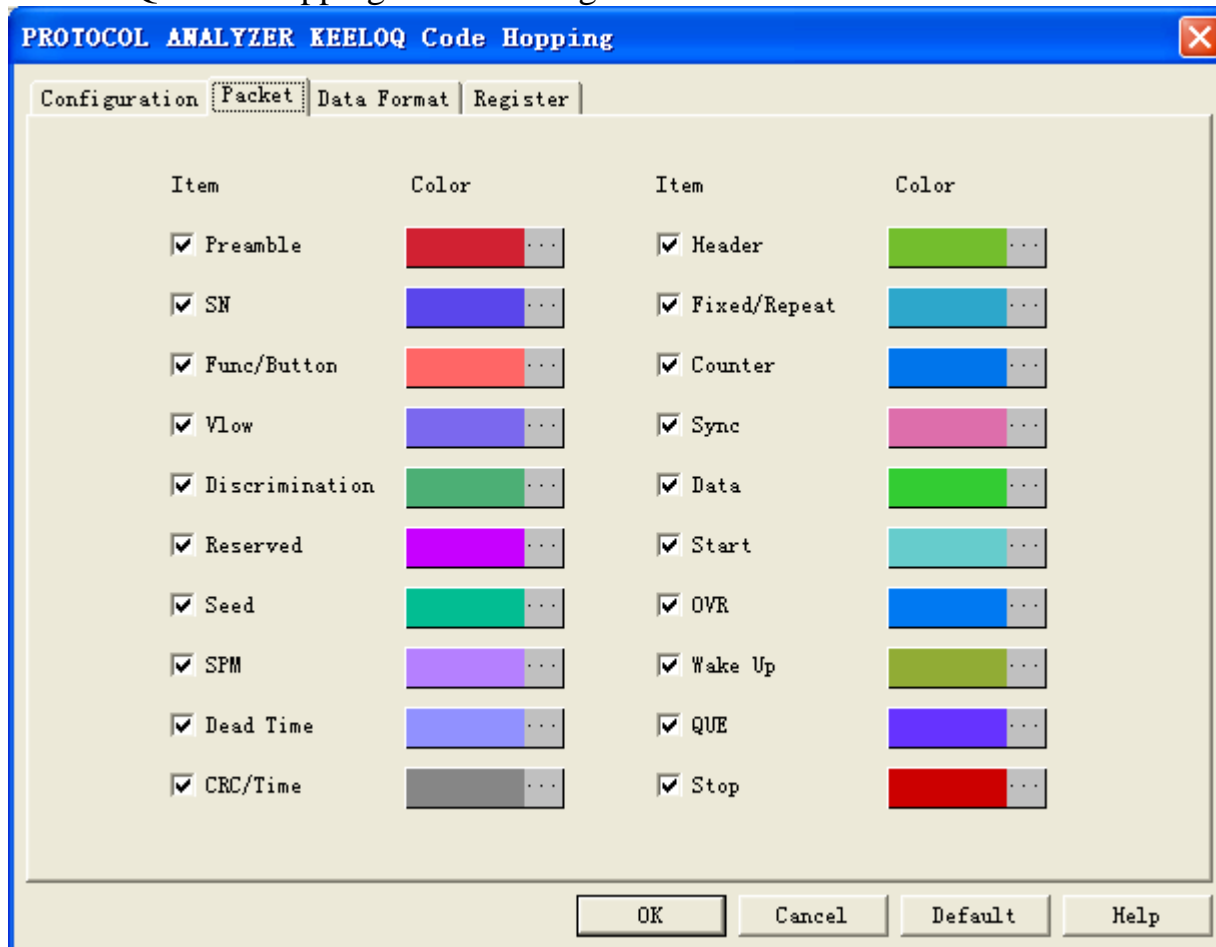
Calculation Methods:

1. For searching the PWM/Data line, the most before and the last segments of the Ds and Dp are ignored.
2. Then find the 100 segments level, if not, find the existed, and then find out the min Tmin.(But it is not less than 1us).
3. Then find out the 1~1.5Tmin segment to accumulate as N, the Time is T, and Automatic Value =T/N. If the N is 0, Automatic Value =1.

Protocol Analyzer Color:

The protocol analyzer colors can be varied by users.

KEELOQ Code Hopping Packet dialog box



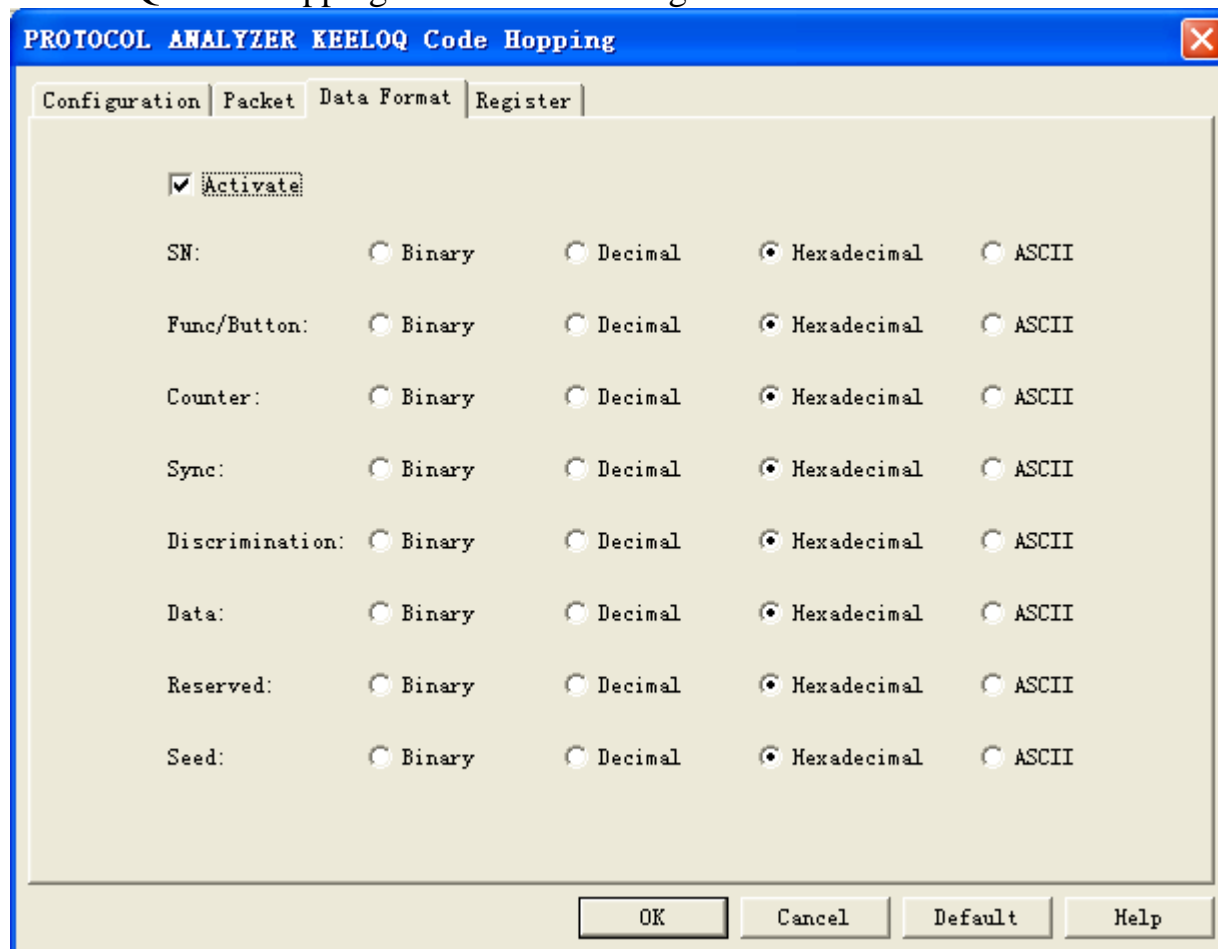
The dialog box is titled "PROTOCOL ANALYZER KEELOQ Code Hopping" and has a close button (X) in the top right corner. It contains four tabs: "Configuration", "Packet" (selected), "Data Format", and "Register". The "Packet" tab displays a list of items and their corresponding colors, each with a checkbox and a color selection bar.

Item	Color	Item	Color
<input checked="" type="checkbox"/> Preamble	Red	<input checked="" type="checkbox"/> Header	Green
<input checked="" type="checkbox"/> SN	Blue	<input checked="" type="checkbox"/> Fixed/Repeat	Cyan
<input checked="" type="checkbox"/> Func/Button	Red	<input checked="" type="checkbox"/> Counter	Blue
<input checked="" type="checkbox"/> Wlow	Blue	<input checked="" type="checkbox"/> Sync	Pink
<input checked="" type="checkbox"/> Discrimination	Green	<input checked="" type="checkbox"/> Data	Green
<input checked="" type="checkbox"/> Reserved	Magenta	<input checked="" type="checkbox"/> Start	Cyan
<input checked="" type="checkbox"/> Seed	Teal	<input checked="" type="checkbox"/> OVR	Blue
<input checked="" type="checkbox"/> SPM	Purple	<input checked="" type="checkbox"/> Wake Up	Olive
<input checked="" type="checkbox"/> Dead Time	Blue	<input checked="" type="checkbox"/> QUE	Purple
<input checked="" type="checkbox"/> CRC/Time	Grey	<input checked="" type="checkbox"/> Stop	Red

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

In the Packet part, users can select the items and colors according to users' requirements.

KEELOQ Code Hopping Data Format dialog box



PROTOCOL ANALYZER KEELOQ Code Hopping

Configuration | Packet | Data Format | Register

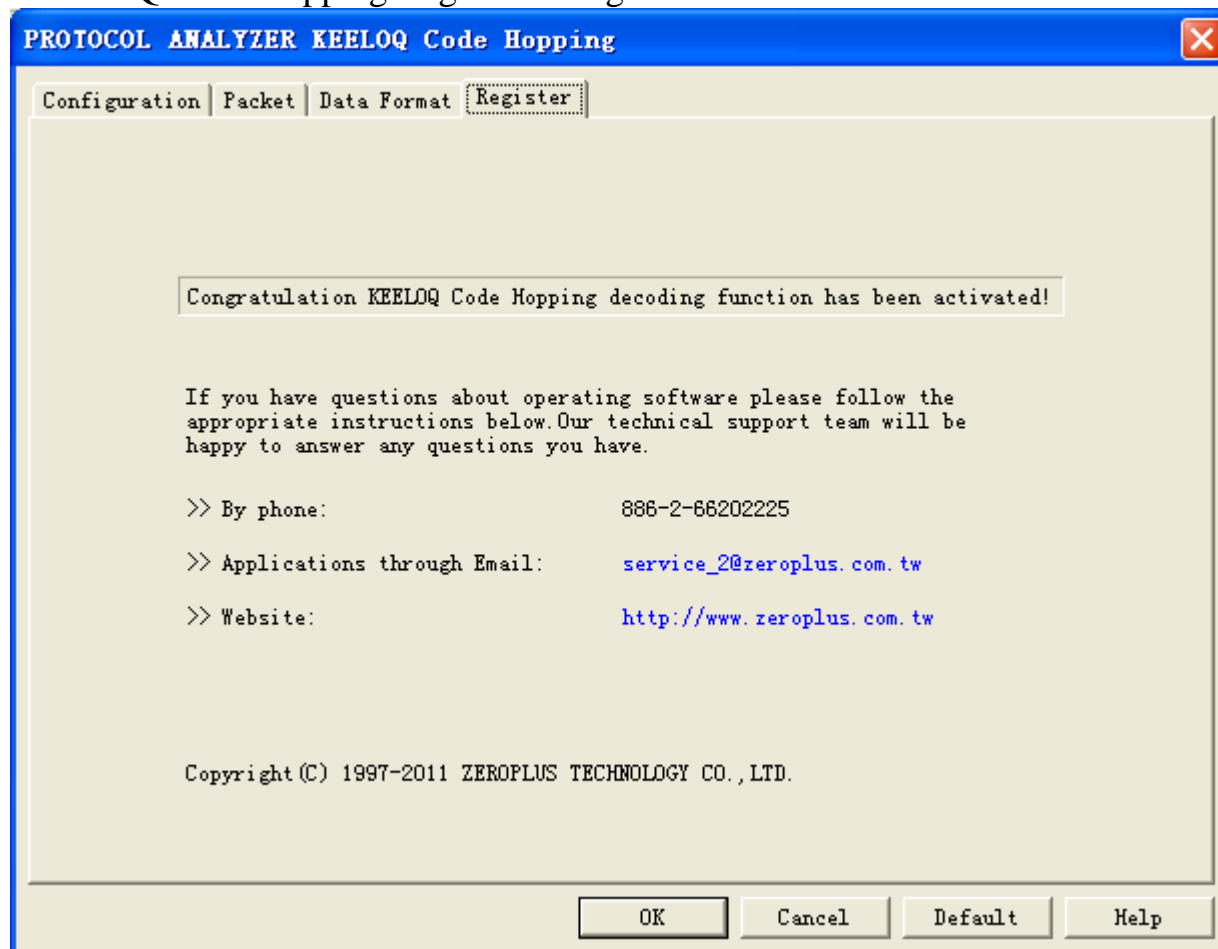
☒ Activate

SN:	<input type="radio"/> Binary	<input type="radio"/> Decimal	<input checked="" type="radio"/> Hexadecimal	<input type="radio"/> ASCII
Func/Button:	<input type="radio"/> Binary	<input type="radio"/> Decimal	<input checked="" type="radio"/> Hexadecimal	<input type="radio"/> ASCII
Counter:	<input type="radio"/> Binary	<input type="radio"/> Decimal	<input checked="" type="radio"/> Hexadecimal	<input type="radio"/> ASCII
Sync:	<input type="radio"/> Binary	<input type="radio"/> Decimal	<input checked="" type="radio"/> Hexadecimal	<input type="radio"/> ASCII
Discrimination:	<input type="radio"/> Binary	<input type="radio"/> Decimal	<input checked="" type="radio"/> Hexadecimal	<input type="radio"/> ASCII
Data:	<input type="radio"/> Binary	<input type="radio"/> Decimal	<input checked="" type="radio"/> Hexadecimal	<input type="radio"/> ASCII
Reserved:	<input type="radio"/> Binary	<input type="radio"/> Decimal	<input checked="" type="radio"/> Hexadecimal	<input type="radio"/> ASCII
Seed:	<input type="radio"/> Binary	<input type="radio"/> Decimal	<input checked="" type="radio"/> Hexadecimal	<input type="radio"/> ASCII

OK Cancel Default Help

Users can set the Data Format of the SN, Func/Button, Counter, Sync, Discrimination, Data, Reserved, Seed as their requirements. When selecting the option, Activate, the data formats are decided by the settings in the Protocol Analyzer; when not selecting the option, Activate, the data formats are decided by the settings in the main program.

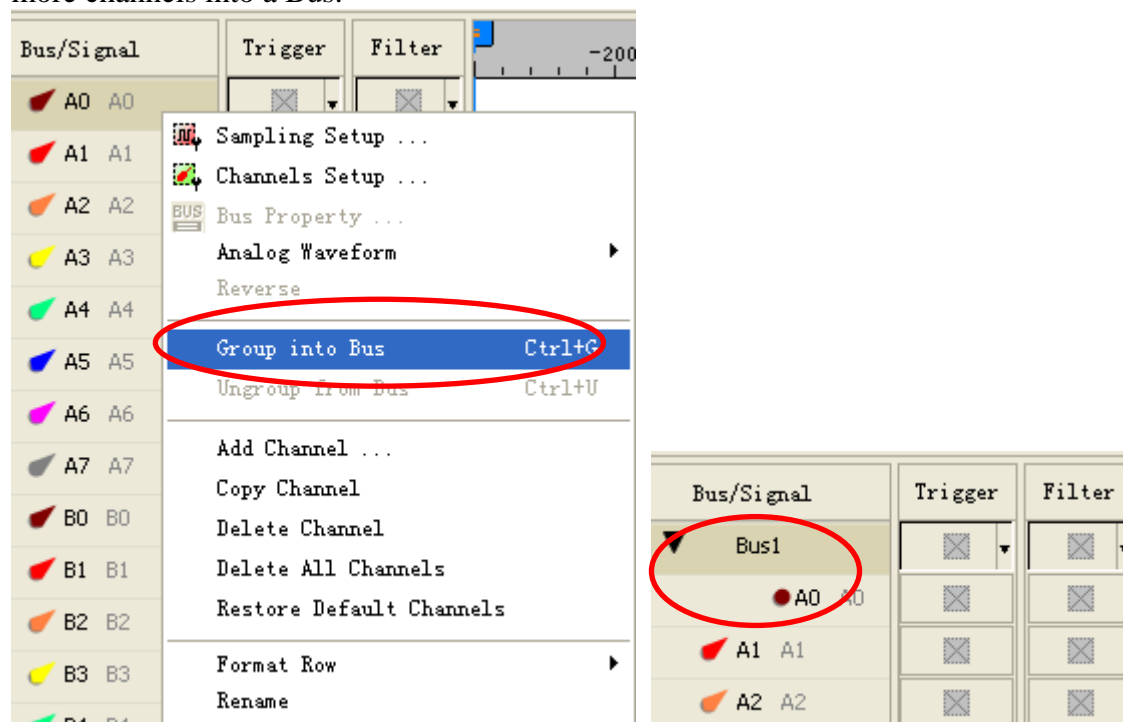
KEELOQ Code Hopping Register dialog box



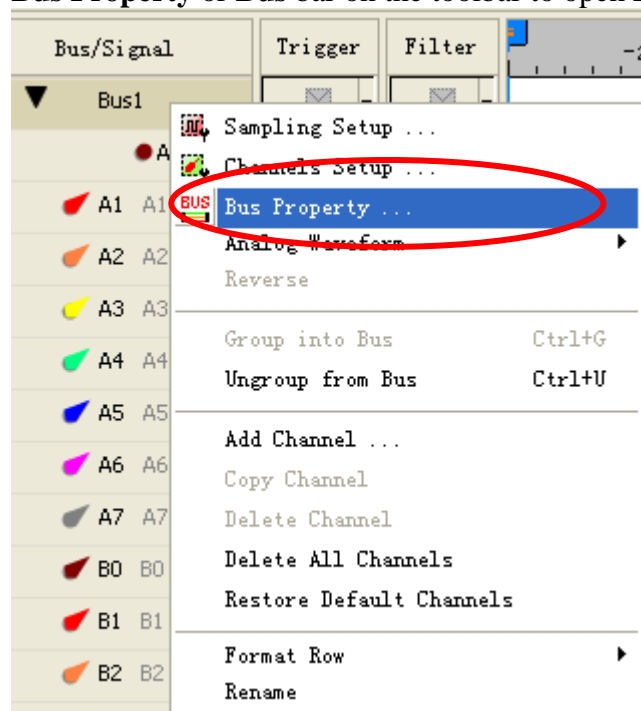
There is Zeroplus company information. If you have any questions about software operations, you can contact Zeroplus by Telephone or Email.

3. Operating Instructions

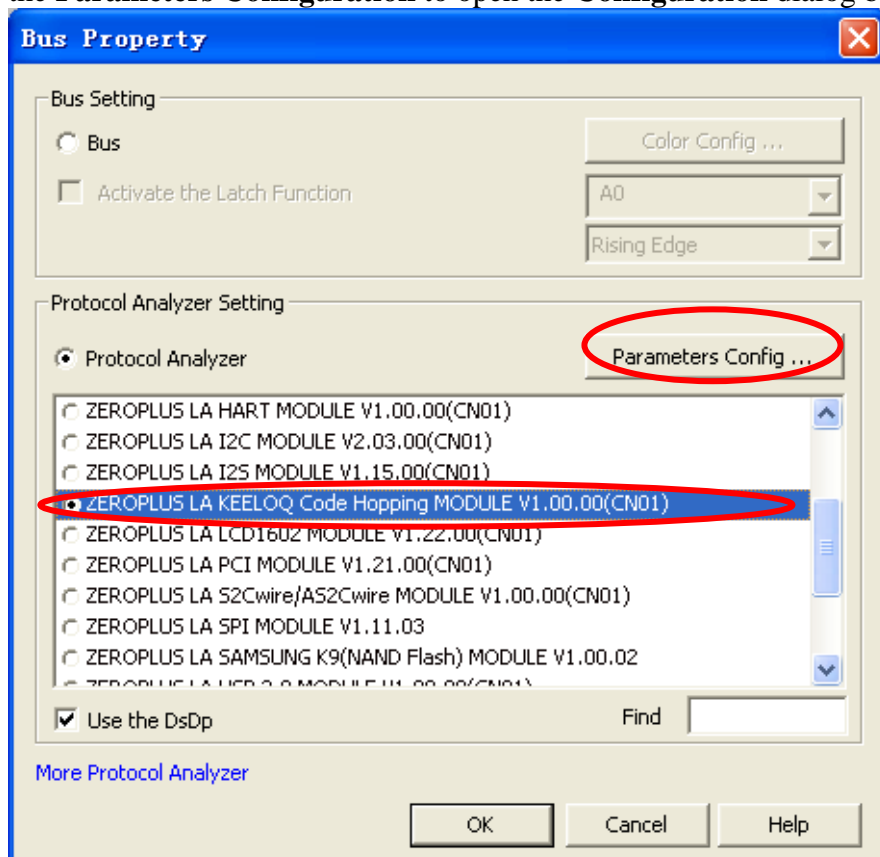
STEP 1. Open the Logic Analyzer and group A0 into **Bus1** by pressing the **Right Key** on the mouse. KEELOQ Code Hopping needs one channel to decode signals at least, so it is necessary to group one or more channels into a Bus.



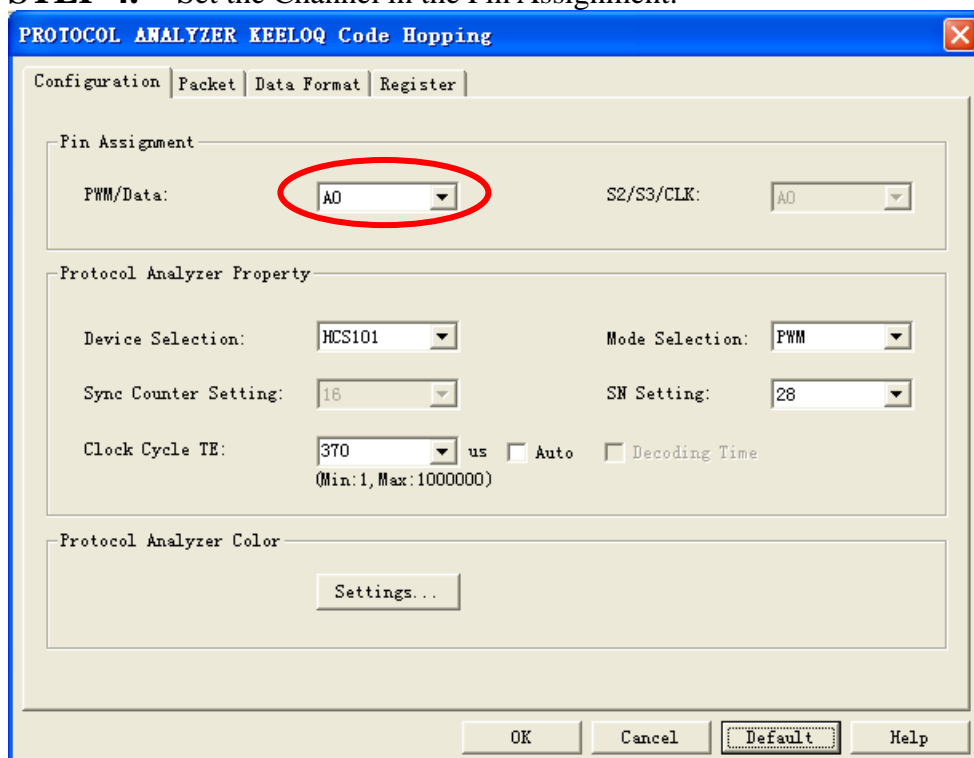
STEP 2. Select **Bus1**, then press **Right Key** on the mouse to list the menu, then press **Bus Property** or **Bus** bar on the toolbar to open **Bus Property** dialog box.



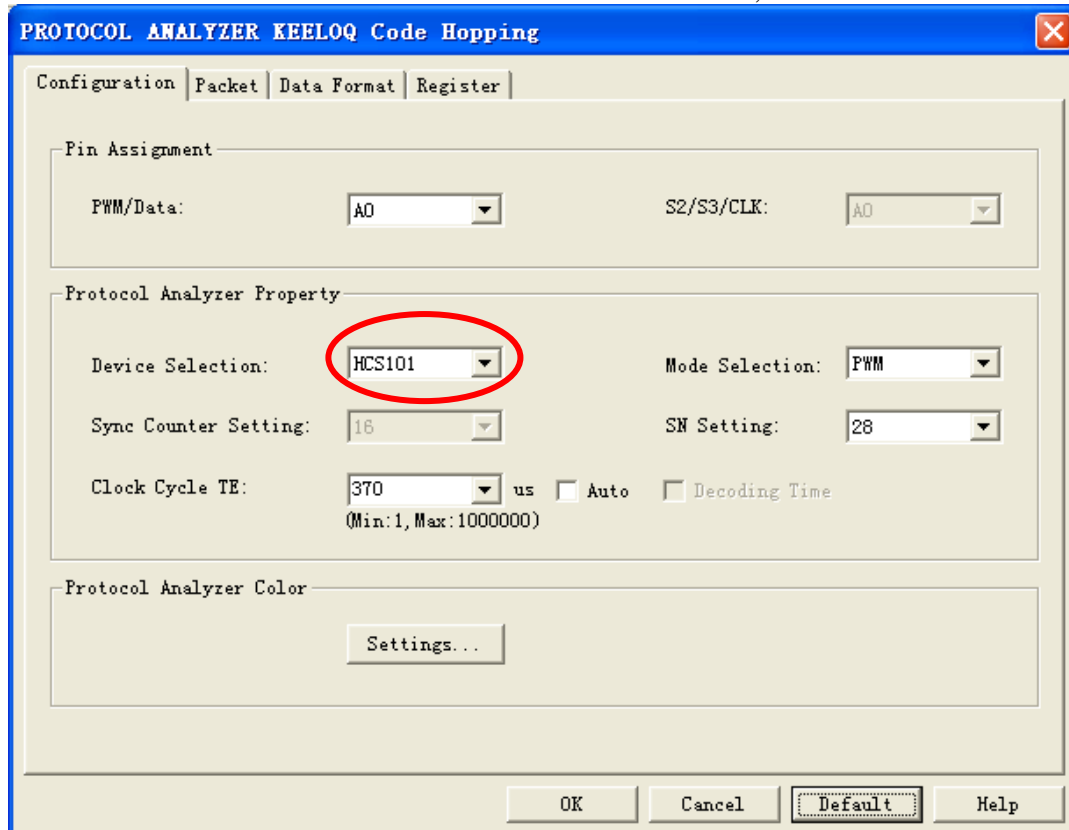
STEP 3. For Protocol Analyzer KEELOQ Code Hopping Parameters Configuration, click Protocol Analyzer and select **ZEROPLUS LA KEELOQ Code Hopping MODULE V1.00.00(CN01)** and click the **Parameters Configuration** to open the **Configuration** dialog box.



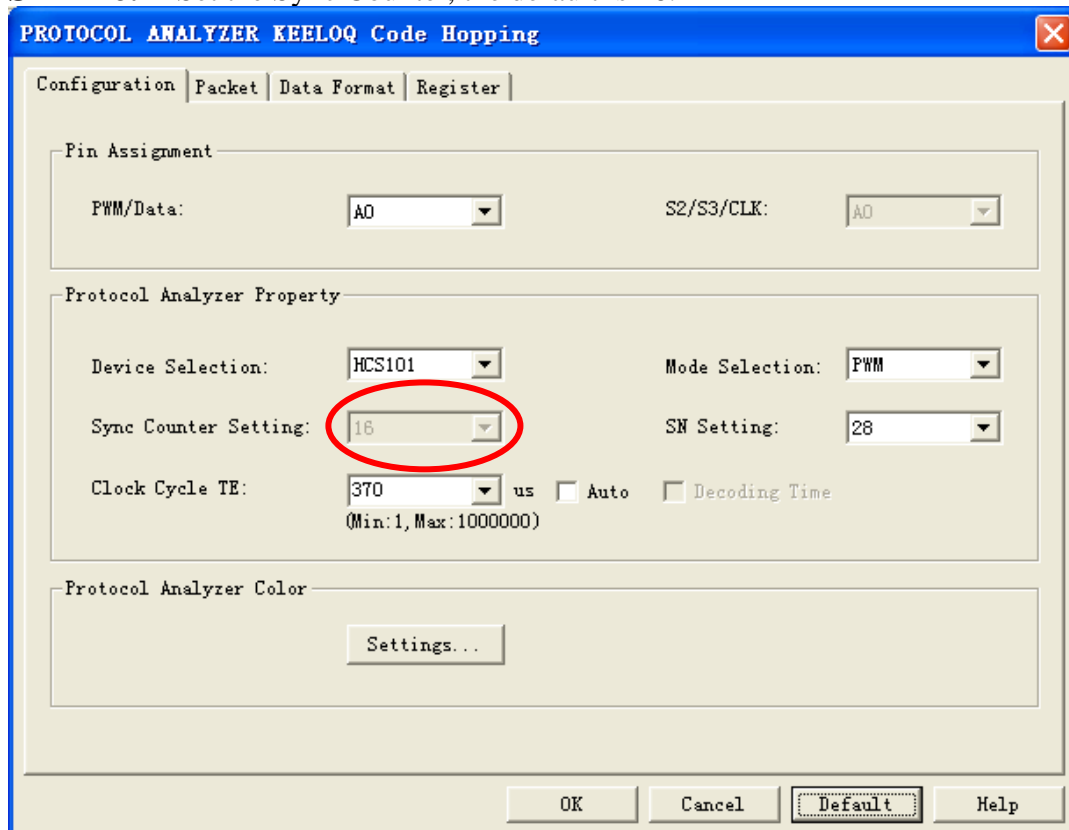
STEP 4. Set the Channel in the Pin Assignment.



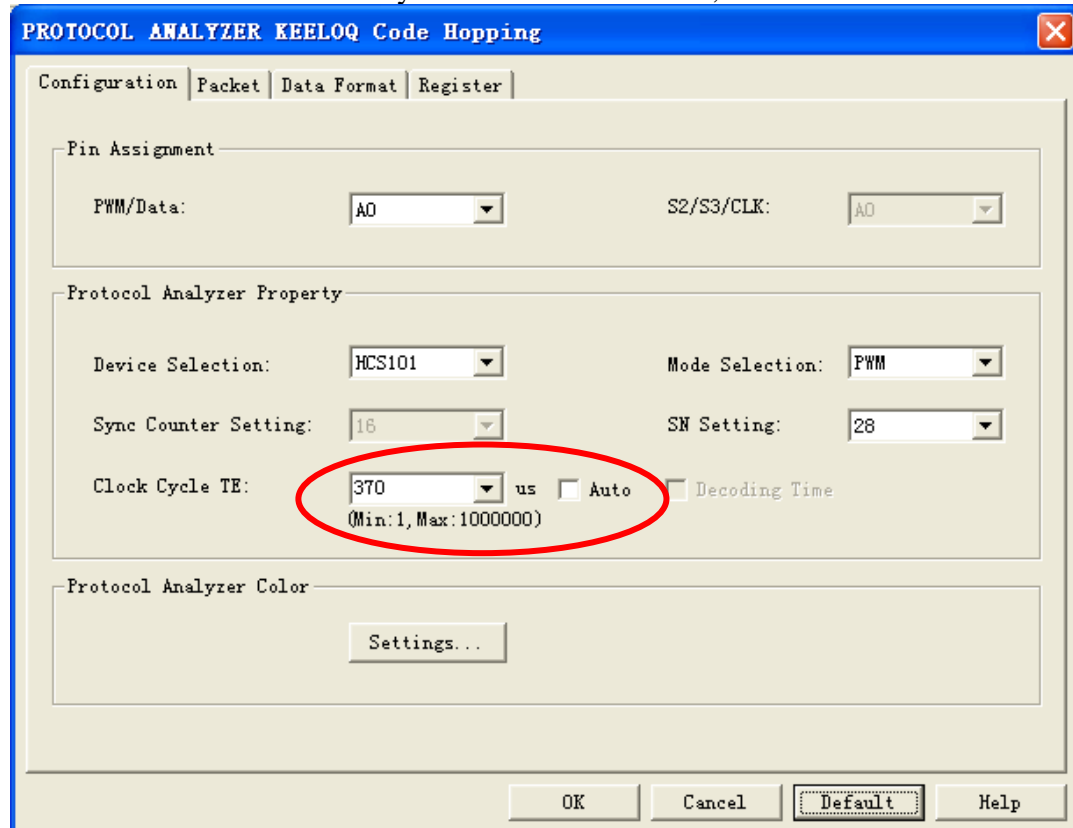
STEP 5. Set the Device Selection in HCS101~HCS500, the default is HCS101.



STEP 6. Set the Sync Counter, the default is 16.

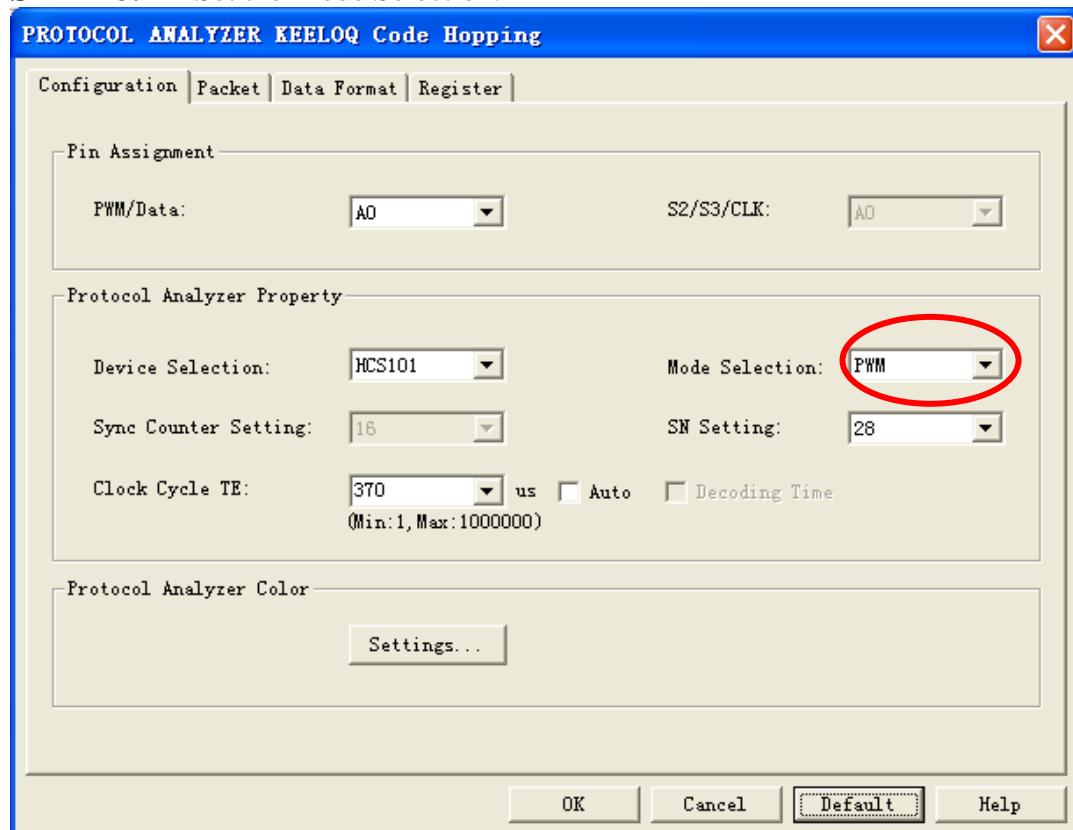


STEP 7. Set the Clock Cycle TE in 1~1000000us, and it also can select the Auto.



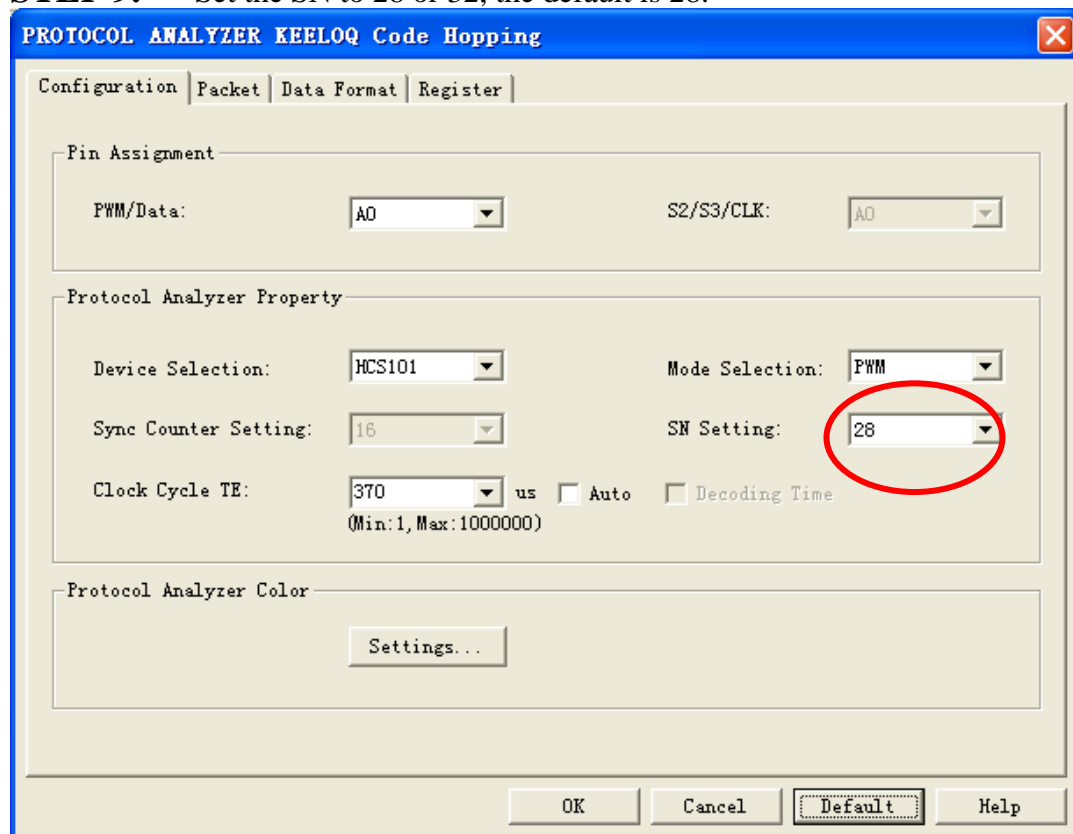
The screenshot shows the 'PROTOCOL ANALYZER KEELOQ Code Hopping' dialog box. The 'Configuration' tab is selected. In the 'Protocol Analyzer Property' section, the 'Clock Cycle TE' field is highlighted with a red circle. It shows '370' in the dropdown and 'us' next to it. Below the field, it says '(Min:1, Max:1000000)'. There are also checkboxes for 'Auto' and 'Decoding Time'. The 'Settings...' button is visible in the 'Protocol Analyzer Color' section.

STEP 8. Set the Mode Selection.



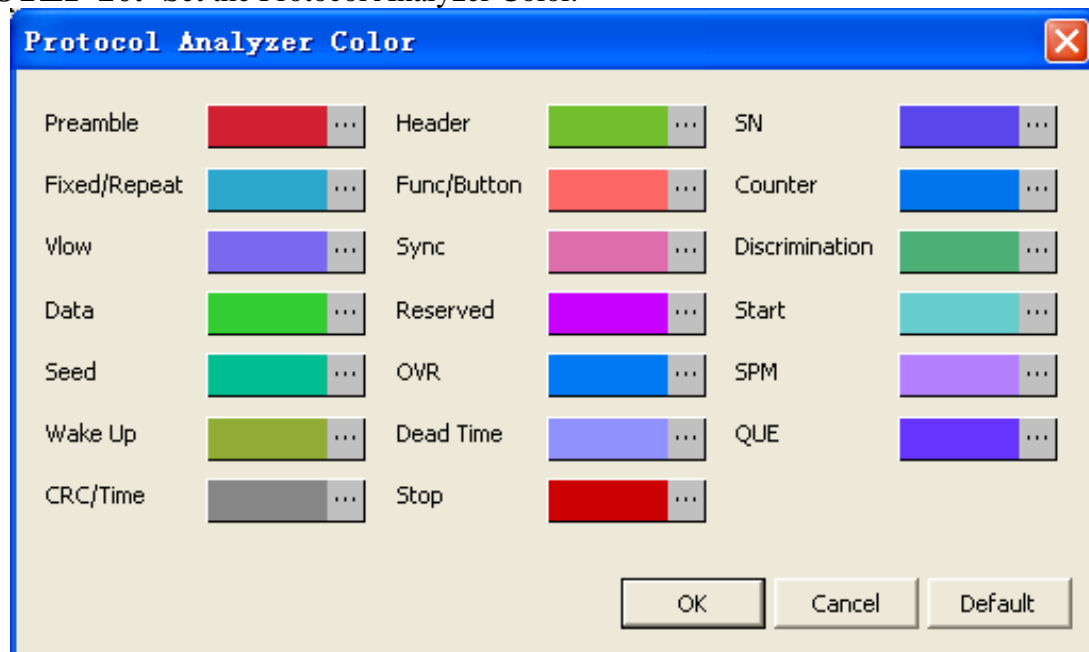
The screenshot shows the same 'PROTOCOL ANALYZER KEELOQ Code Hopping' dialog box. In this step, the 'Mode Selection' dropdown in the 'Protocol Analyzer Property' section is highlighted with a red circle. It shows 'PWM' selected. The 'Clock Cycle TE' field is still set to '370' and 'us'.

STEP 9. Set the SN to 28 or 32, the default is 28.



The screenshot shows the 'PROTOCOL ANALYZER KEELOQ Code Hopping' window with the 'Configuration' tab selected. The 'SN Setting' dropdown menu is highlighted with a red circle, showing the value '28'. Other settings include: PWM/Data: A0, S2/S3/CLK: A0, Device Selection: MCS101, Mode Selection: PWM, Sync Counter Setting: 16, Clock Cycle TE: 370 us, and a 'Settings...' button in the 'Protocol Analyzer Color' section.

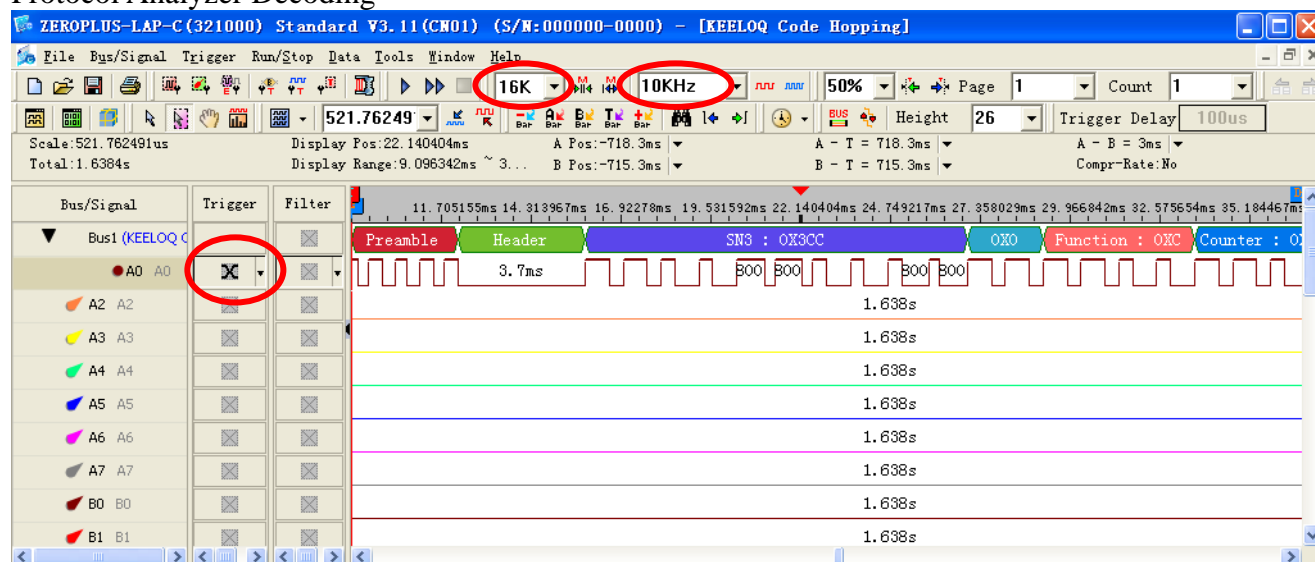
STEP 10. Set the Protocol Analyzer Color.



The screenshot shows the 'Protocol Analyzer Color' window. It displays a grid of color selection buttons for various fields. The fields and their corresponding colors are: Preamble (Red), Header (Green), SN (Purple), Fixed/Repeat (Cyan), Func/Button (Pink), Counter (Blue), Vlow (Purple), Sync (Pink), Discrimination (Green), Data (Green), Reserved (Magenta), Start (Cyan), Seed (Cyan), OVR (Blue), SPM (Purple), Wake Up (Green), Dead Time (Blue), QUE (Purple), CRC/Time (Grey), and Stop (Red). The 'OK', 'Cancel', and 'Default' buttons are at the bottom.

STEP 11. Following pictures show the completion of the protocol analyzer decoding and packet list. The Trigger condition is Either Edge; the Memory depth is 16K; the Sampling frequency is 10KHz (the sampling frequency should be more than four times higher than the signal to be tested).

Protocol Analyzer Decoding



Packet List

