



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

# SPECIFICATION

**MODEL: B11006- HART**

**PART NO :** \_\_\_\_\_

**VERSION :** V1.00

Approver		Check	Design
GM	PM		

<b>Customer Confirm</b>

\* Please fax the file to  
Zeroplus Technology after  
signing.



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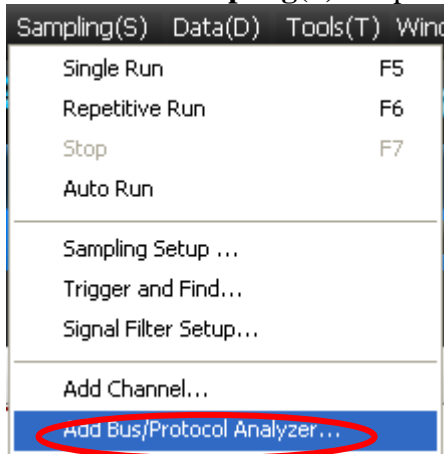
## 1. Software Register

Please register the software as the following steps:

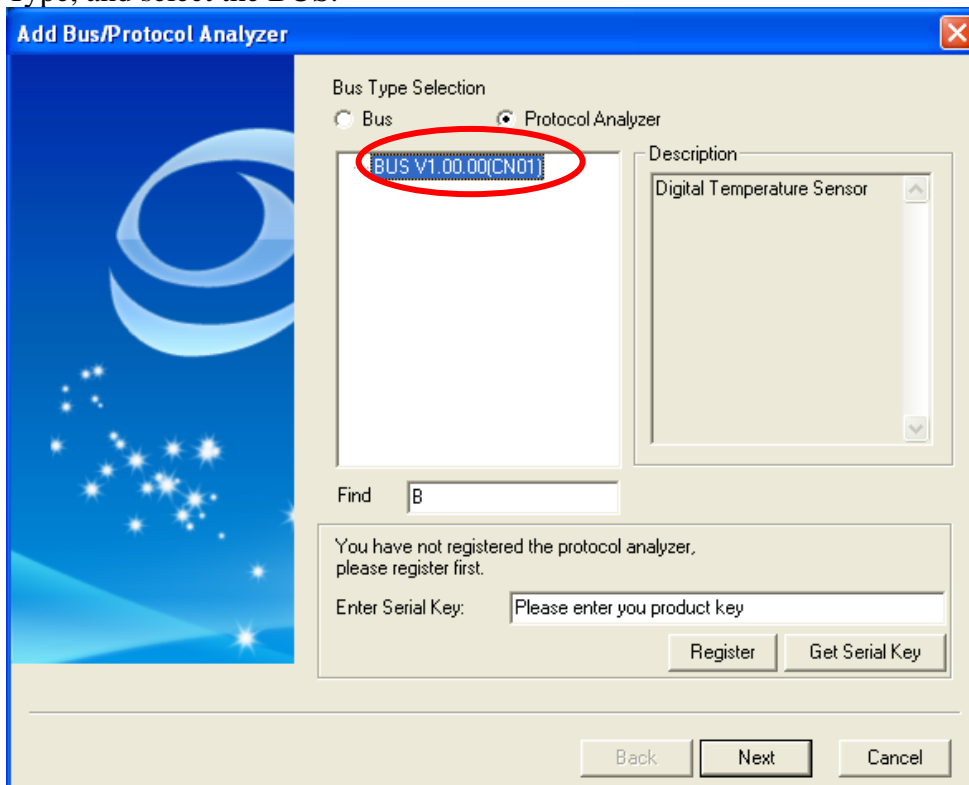
※ Remark1: The registration steps for all protocol analyzers are the same; you can complete the registration by following procedures. Following is an example on how to register the Protocol Analyzer BUS.

※ 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 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.

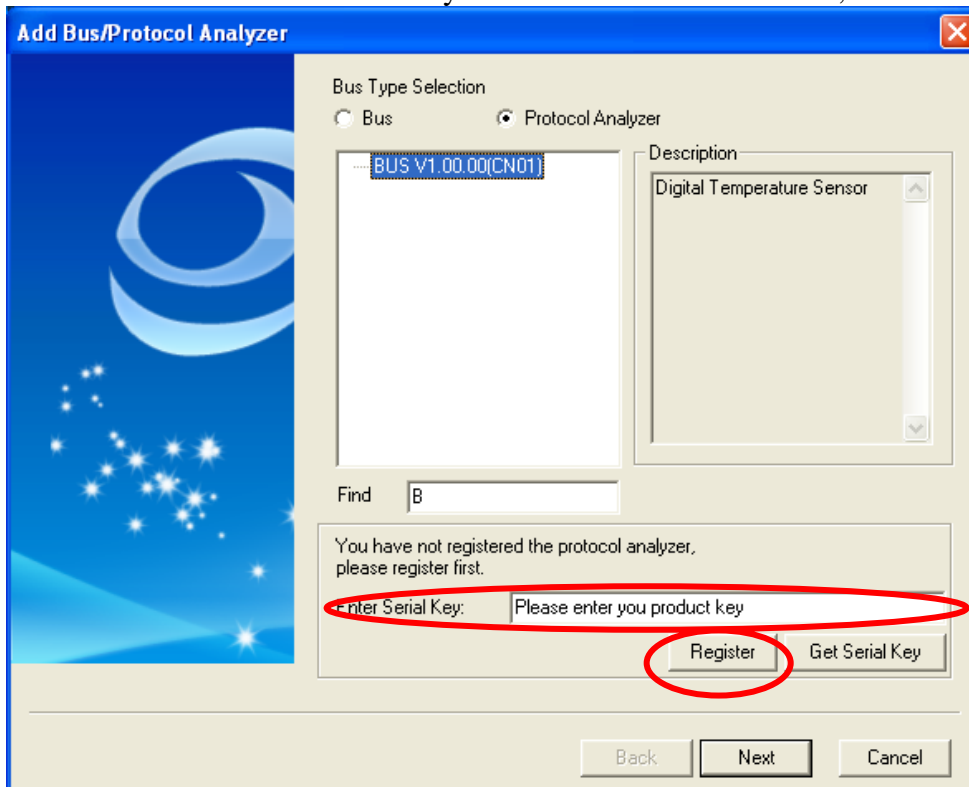


**STEP 2.** Select Protocol Analyzer item in the Add Bus/Protocol Analyzer dialog box, expand the Other Type, and select the BUS.

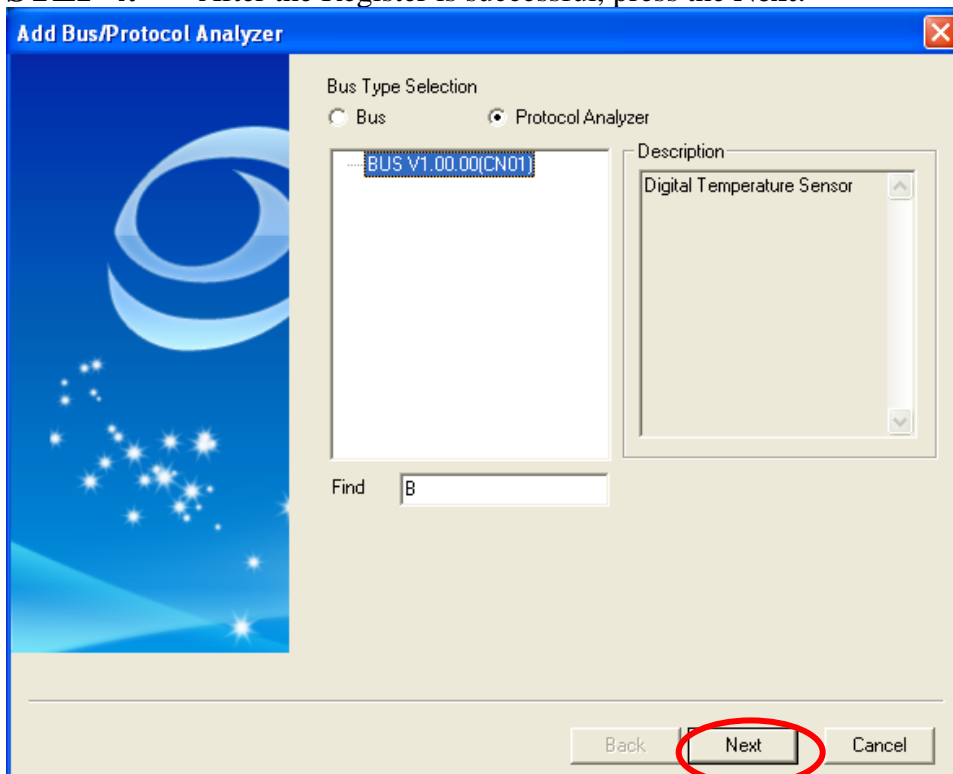




**STEP 3.** Enter the Serial Key of the BUS under this Model, and then press the **Register**.



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





## 2. User Interface

Please refer to the below images to select options of **HART** module.

### Pin Assignment:

**Channel:** It uses one channel RS232 decoding.

### Protocol Analyzer Property:

**Parity Check:** Users can select Odd Parity, Even Parity or None Parity. And the default is None Parity.

**Transmission Direction:** The default direction is LSB→MSB.

**Baud Rate:** The input value can be 1bps→10Mbps. Users also can select 110, 300, 600, 1200, 2400, 4800, 9600, 19200, 38400, 57600, 15200, 230400, 460800, 921600 bps from the pull-down menu.

Notice: When the Baud Rate changes, the sending interval between two characters will change too.

**Auto:** Below are the detailed operating steps.

1. First, it will auto-judge the bitwise is reversed or not. If not, the signal is normal; if the first part is low, it will be ignored; and if the last part is also low, it will also be ignored and the main program does the following calculation.
2. It will find the longest Low Level part (Lmax), if there is any Low Level part that is lower than Lmax/10, it will ignore the value and do the following calculation.
3. It will find the shortest Low Level part (Lmin). It will find the Low Level of  $(1 \sim 1.15) \times Lmin$  and mark the number with N1, then find the Low Level of  $(2 \sim 2.3) \times Lmin$  and mark the number with N2; it totals 20 parts ( $N1 + N2 = 20$ ). The average value is (total value of Low Level parts) / ( $N1 + 2N2$ ). If there is not such 20 parts in the whole signal, then it will recode the total parts that the signal has, and the average value still is (total value of Low Level parts) / ( $N1 + 2N2$ ).
4. The average value is a time length value, it is no need to convert it to baud rate and can be decoded as bit length.
5. If the bitwise is reversed, the Low Level mentioned above should be High Level, because all should be reversed.



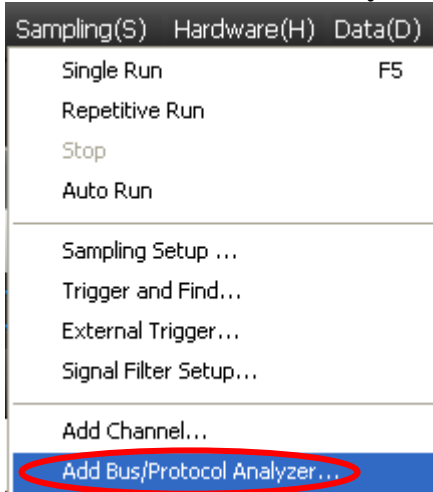
**Data Reverse Decoding:** All lines should be reversed, which means it will decode the Low as High and the High as Low in the decoding.

**Frame Decoding:** When selecting this option, it will decode the Frame Format; and it is selected in default.

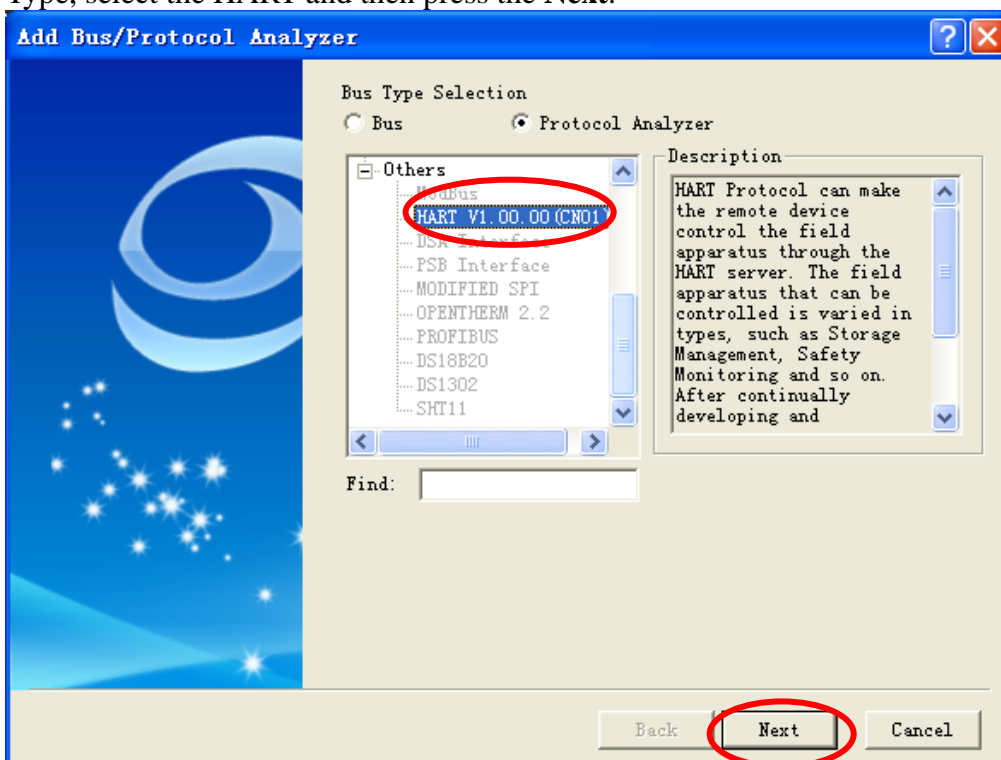
**Protocol Analyzer Format:** The **Protocol Analyzer Color** can be varied by users. The Items (Data, Address, Command, Byte Count, Check Byte and Response Code) can be set as Binary, Decimal, Hexadecimal, ASCII or Default. And the Data Format of the Items (Data, Address, Command, Byte Count, Check Byte and Response Code) 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 the items (Data, Address, Command, Byte Count, Check Byte and Response Code) is the Default.

### 3. 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 Other Type, select the HART and then press the **Next**.





### STEP 3. Set the Pin Assignment.

**PROTOCOL ANALYZER HART**

Pin Assignment

Channel: A0

Protocol Analyzer Property

Parity Check: Odd Parity Transmission Direction: LSB->MSB Baud Rate: 1200 Auto  
(Min:1bps, Max:10Mbps)

☒ Data Reverse Decoding ☒ Frame Decoding

Protocol Analyzer Format

Item	Color	Data Format	Item	Color	Data Format
Start	[Cyan]	Default	Data	[Green]	Default
Parity	[Purple]	Default	Stop	[Red]	Default
Preamble	[Red]	Default	Delimiter	[Orange]	Default
Address	[Orange]	Default	Command	[Pink]	Default
Byte Count	[Light Blue]	Default	Check Byte	[Grey]	Default
Response Code	[Teal]	Default			

Default Back Next Cancel

### STEP 4. Set the Protocol Analyzer Property.

**PROTOCOL ANALYZER HART**

Pin Assignment

Channel: A0

Protocol Analyzer Property

Parity Check: Odd Parity Transmission Direction: LSB->MSB Baud Rate: 1200 Auto  
(Min:1bps, Max:10Mbps)

☒ Data Reverse Decoding ☒ Frame Decoding

Protocol Analyzer Format

Item	Color	Data Format	Item	Color	Data Format
Start	[Cyan]	Default	Data	[Green]	Default
Parity	[Purple]	Default	Stop	[Red]	Default
Preamble	[Red]	Default	Delimiter	[Orange]	Default
Address	[Orange]	Default	Command	[Pink]	Default
Byte Count	[Light Blue]	Default	Check Byte	[Grey]	Default
Response Code	[Teal]	Default			

Default Back Next Cancel





## STEP 5. Set the Protocol Analyzer Format.

**PROTOCOL ANALYZER HART**

Pin Assignment  
Channel: A0

Protocol Analyzer Property  
Parity Check: Odd Parity Transmission Direction: LSB->MSB Baud Rate: 1200 ☐ Auto  
☒ Data Reverse Decoding ☒ Frame Decoding (Min:1bps, Max:10Mbps)

Protocol Analyzer Format

Item	Color	Data Format	Item	Color	Data Format
Start		Default	Data		Default
Parity		Default	Stop		Default
Preamble		Default	Delimiter		Default
Address		Default	Command		Default
Byte Count		Default	Check Byte		Default
Response Code		Default			

Default Back Next Cancel

## STEP 6. Press the Next to finish all settings.

**PROTOCOL ANALYZER HART**

Pin Assignment  
Channel: A0

Protocol Analyzer Property  
Parity Check: Odd Parity Transmission Direction: LSB->MSB Baud Rate: 1200 ☐ Auto  
☒ Data Reverse Decoding ☒ Frame Decoding (Min:1bps, Max:10Mbps)

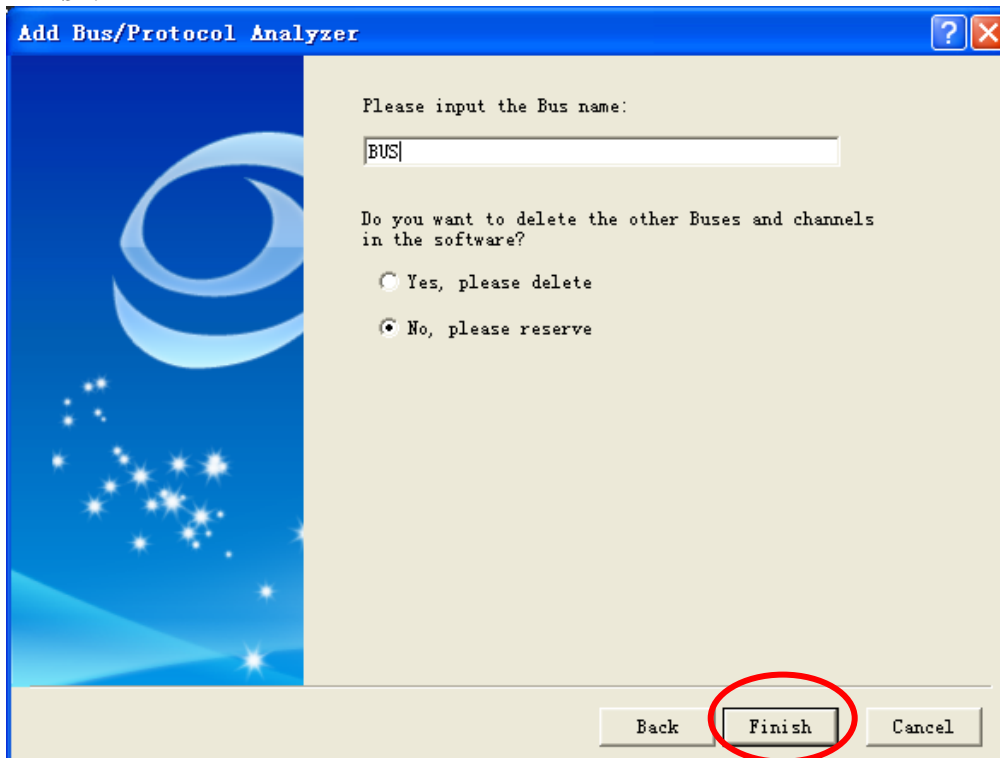
Protocol Analyzer Format

Item	Color	Data Format	Item	Color	Data Format
Start		Default	Data		Default
Parity		Default	Stop		Default
Preamble		Default	Delimiter		Default
Address		Default	Command		Default
Byte Count		Default	Check Byte		Default
Response Code		Default			

Default Back **Next** Cancel

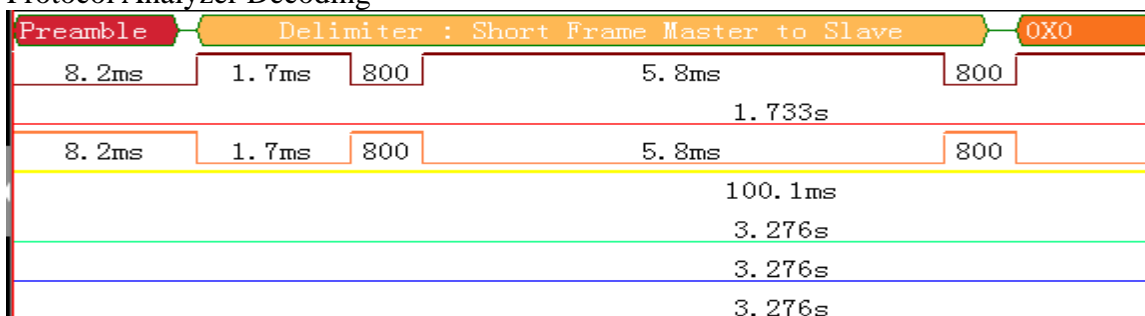


**STEP 7.** Please enter the Bus Name, select **Yes, please delete** or **No, please reserve** and then press **Finish**.



**STEP 8.** Following pictures show the completion of the protocol analyzer decoding and the packet list. The trigger condition is set as Either Edge; the memory depth is 32K; the sampling frequency is 10KHz. (the sampling frequency should be more than ten times higher than the signal to be tested)

#### Protocol Analyzer Decoding



#### Packet List

Packet List

Navigator

Packet List

Statistics

Memory Analyzer

FD

MS

SM

BMS

BSM

Packet #	Name	TimeStamp	Preamble	Delimiter	Polling Address	Reserved
1	Bus1(HART)	0ms	Preamble	Short Frame Master to Slave	0	0
	Not In Burst Mode	Secondary Master	Read Unique Identifier	Byte Count	Check Byte	
	Not In Burst Mode	Secondary Master	00	00	02	
	DESCRIBE					
	Master to Slave					
Packet #	Name	TimeStamp	Preamble	Delimiter	Manufacturer	Not In Burst Mode
2	Bus1(HART)	327.2ms	Preamble	Long Frame Slave to Master	01	Not In Burst Mode
	Primary Master	Device Type	Device Identifier	Read Analog Outputs	Byte Count	Check Byte
	Primary Master	01	20300D	3E	00	25