Coding Box Manual

Part 1: Product Overview and Installation

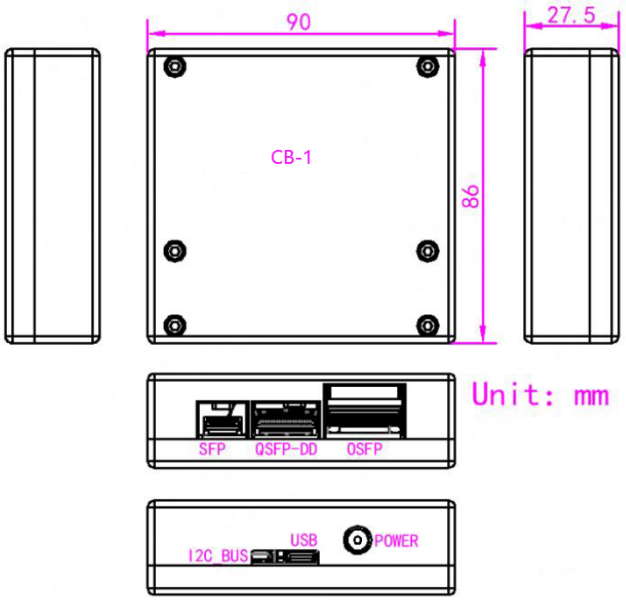
1.1 Product Overview

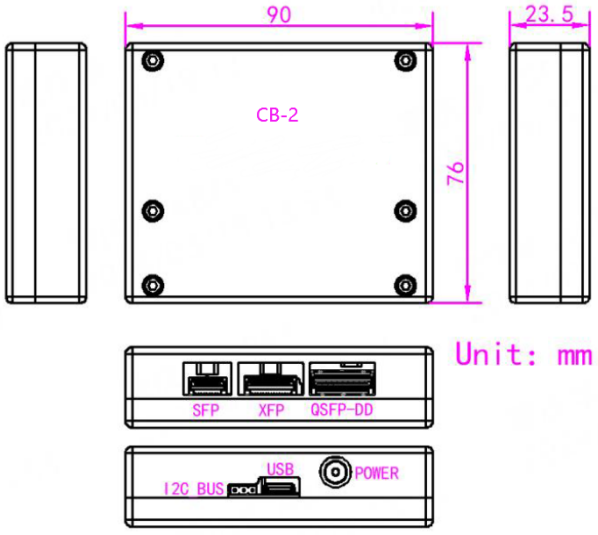
The coding box is designed to support EEPROM reading and writing of SFP/SFP+/SFP28, XFP, QSFP+/QSFP28/QSFP56, QSFP-DD, OSFP optical module/DAC module, and AOC module, displaying detailed information of EEPROM; Customers can use a coding board and supporting software to read and write codes for the optical module according to their own needs. Easy installation and operation process.

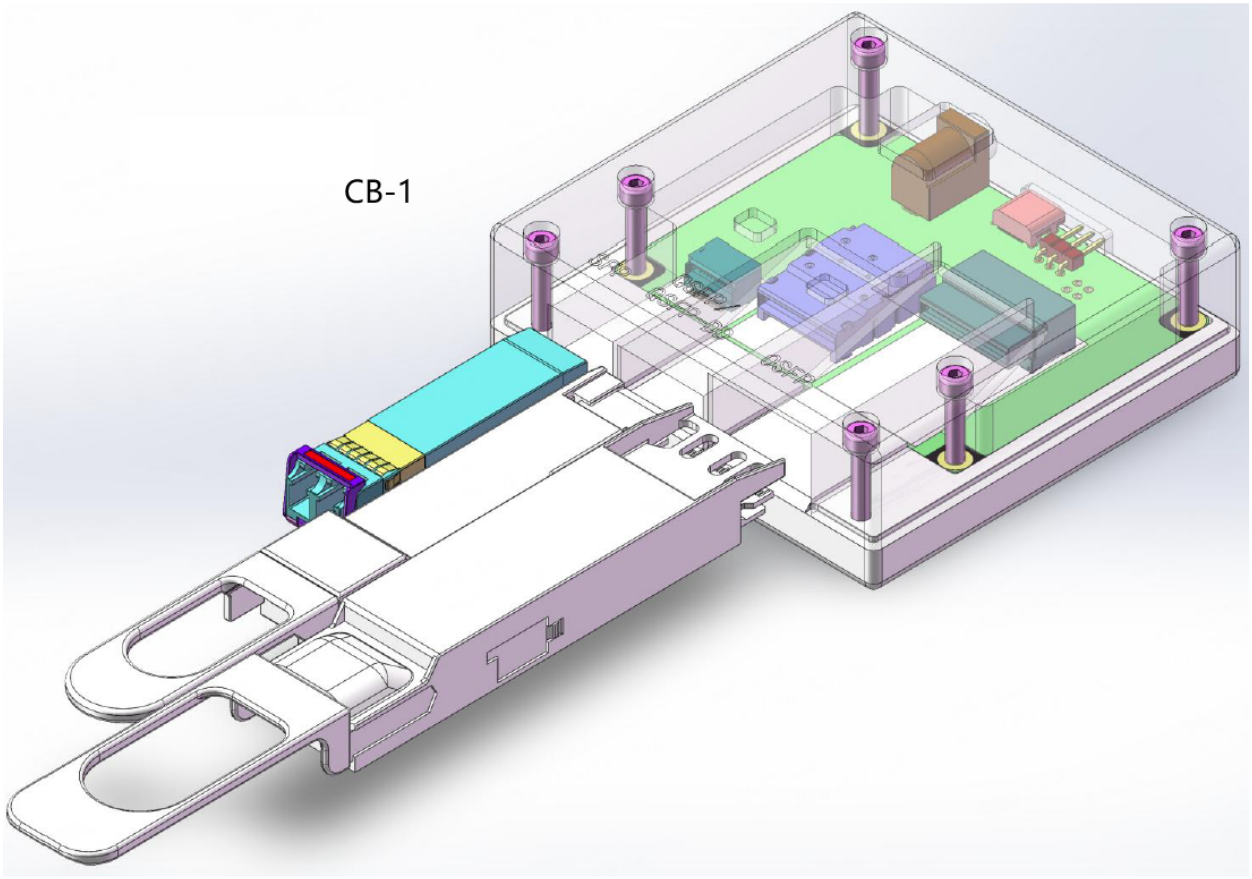
1.2 Operating instructions:

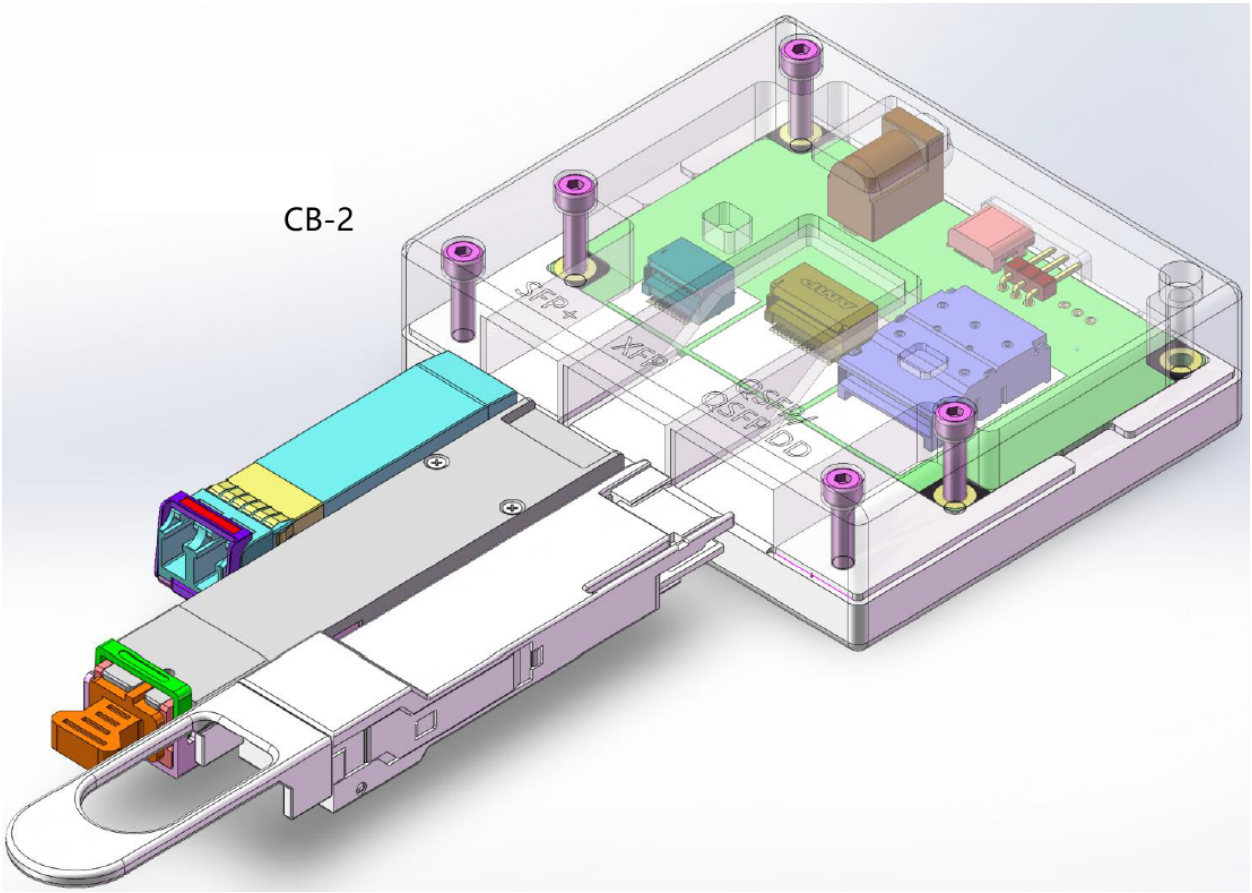
1.2.1 Connect the coding board to the computer via a USB TYPE-C data cable.
1.2.2 Insert optical module or DAC module.
1.2.3 Open the coding software and start coding. (For detailed instructions on coding, please refer to Part 2)

Note1: The coding box does not support multiple modules to write code simultaneously, and only one module can be inserted at the same time when writing code;
Note 2: There is no QSFP base on the coding box. Please insert the QSFP module coding into the QSFP-DD base (refer to the coding box specification for details).
Note 3: There is an I2C bus left on the coding box, SDA, SCL, and GND (GND should be connected firstly) are respectively connected to other main control boards or test boards, this software can be used to read and write modules on other brand coding box; You can also perform corresponding operations on the modules on this coding box through the external control board and supporting software.






CB-1


CB-2

Part 2: Instructions for Coding.

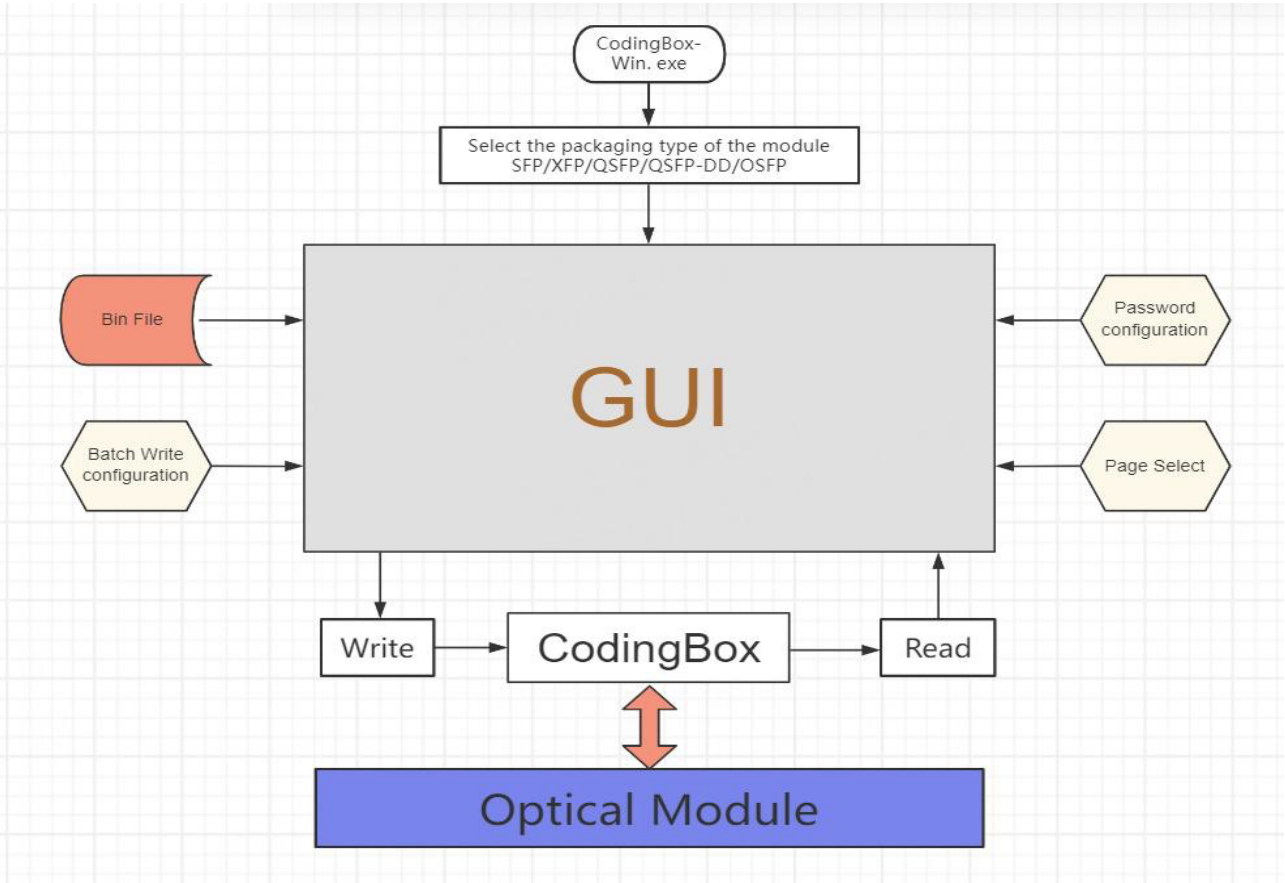
This software is designed based on SFF-8472, INF-8077i, SFF-8636, and CMIS Agreement, and supports EEPROM programming and manufacturer information modification for SFP, XFP, QSFP, QSFP-DD, and OSFP optical modules.

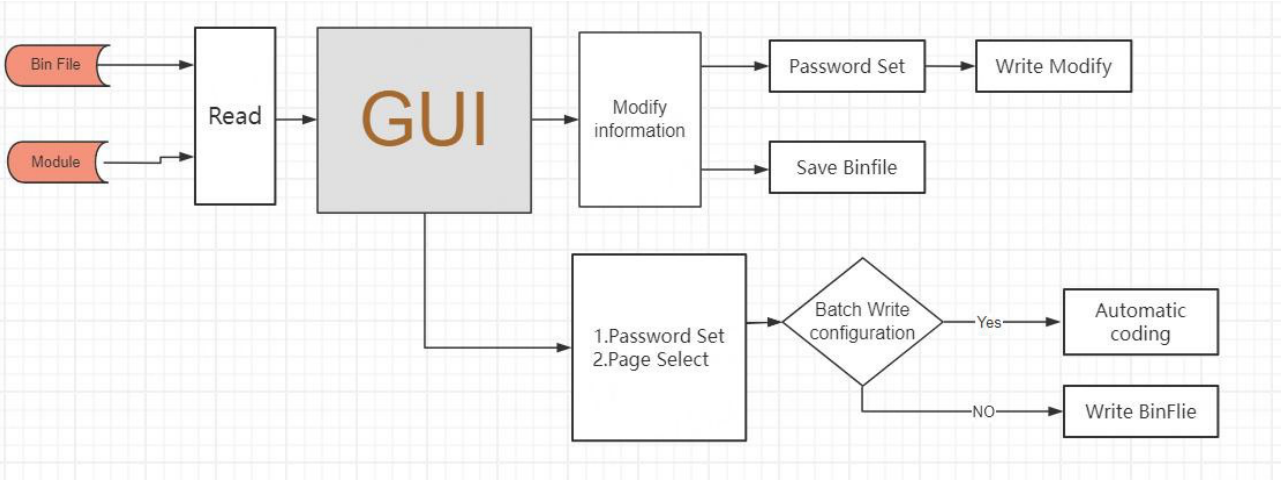
2.0 System Configuration

Hardware configuration: This software requires running on Windows PC and its compatible machines, with a Pentium II or higher CPU, ⩾2GB of memory, and >60GB of hard disk.
Operating system: Windows 7 and above, MacOS.

2.1 Coding Box Data Flow Chart

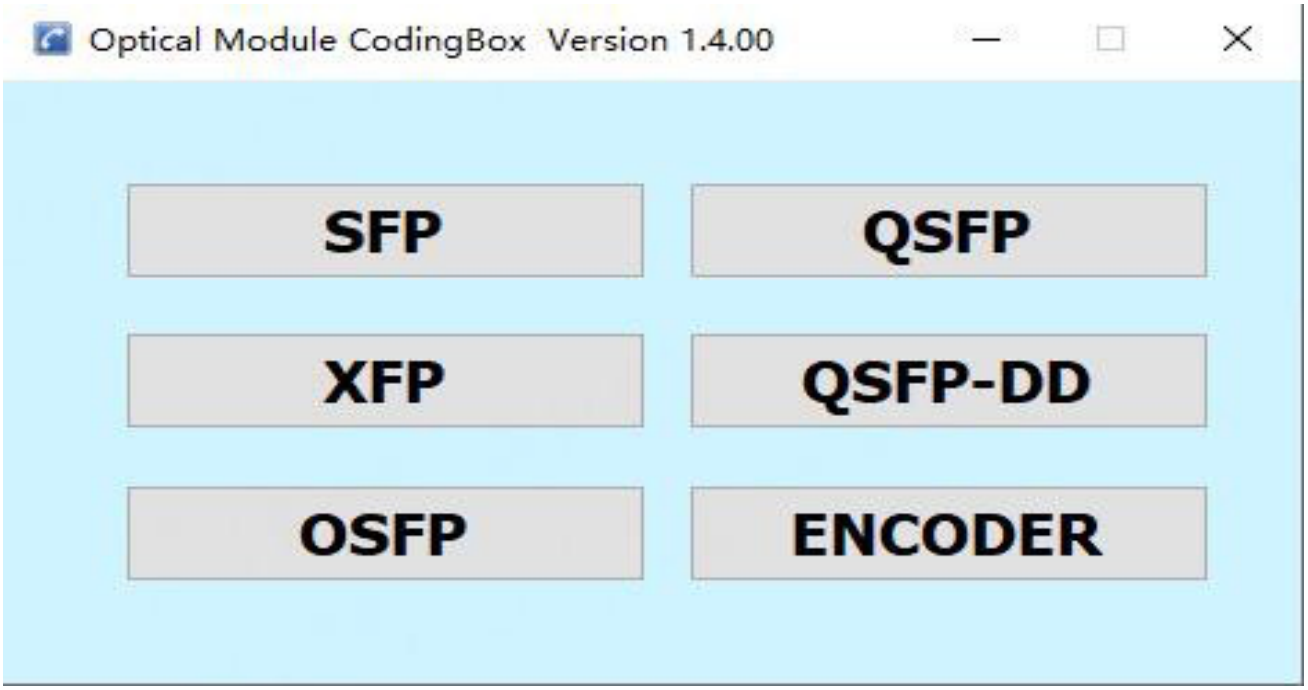
Software Function Block Diagram



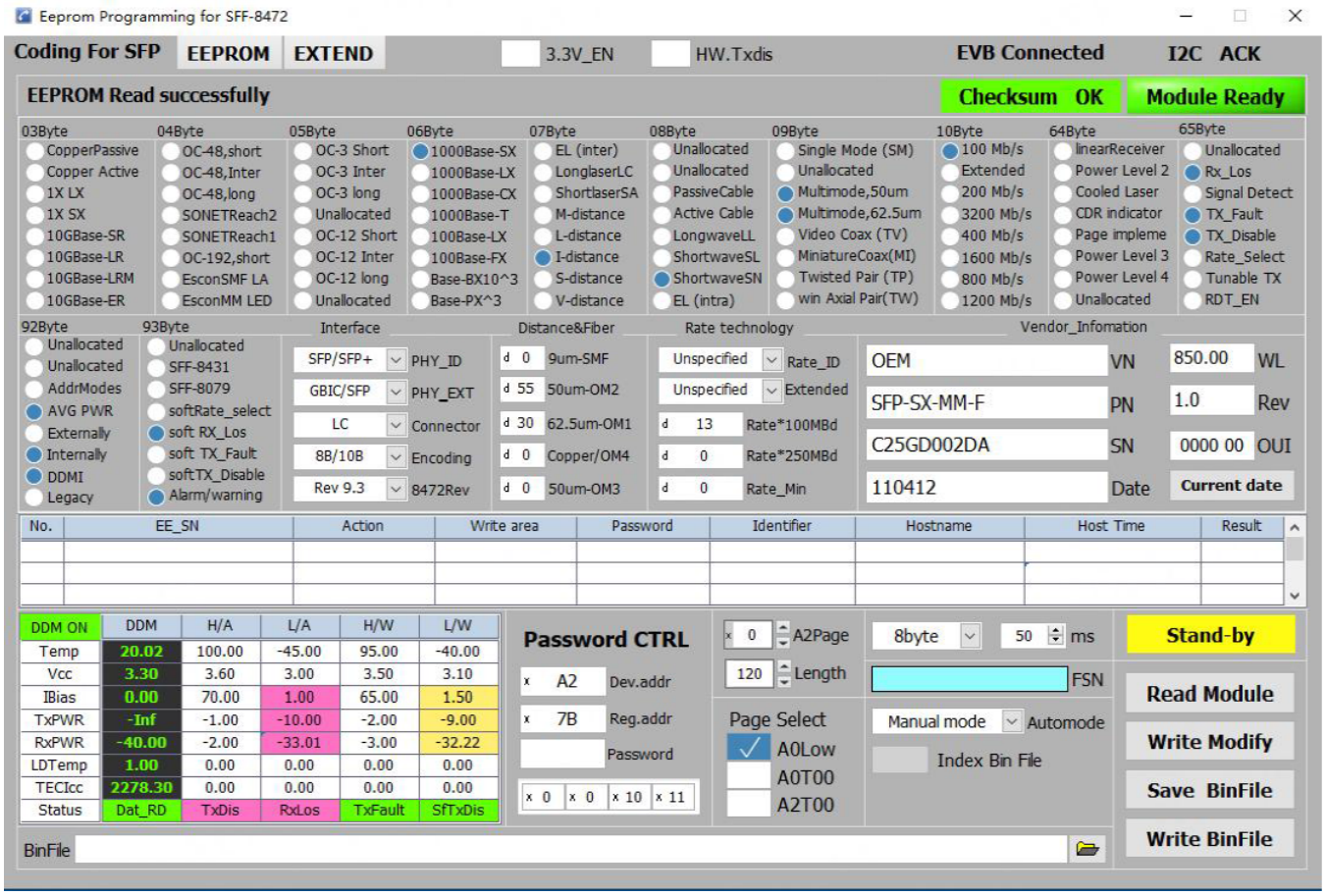


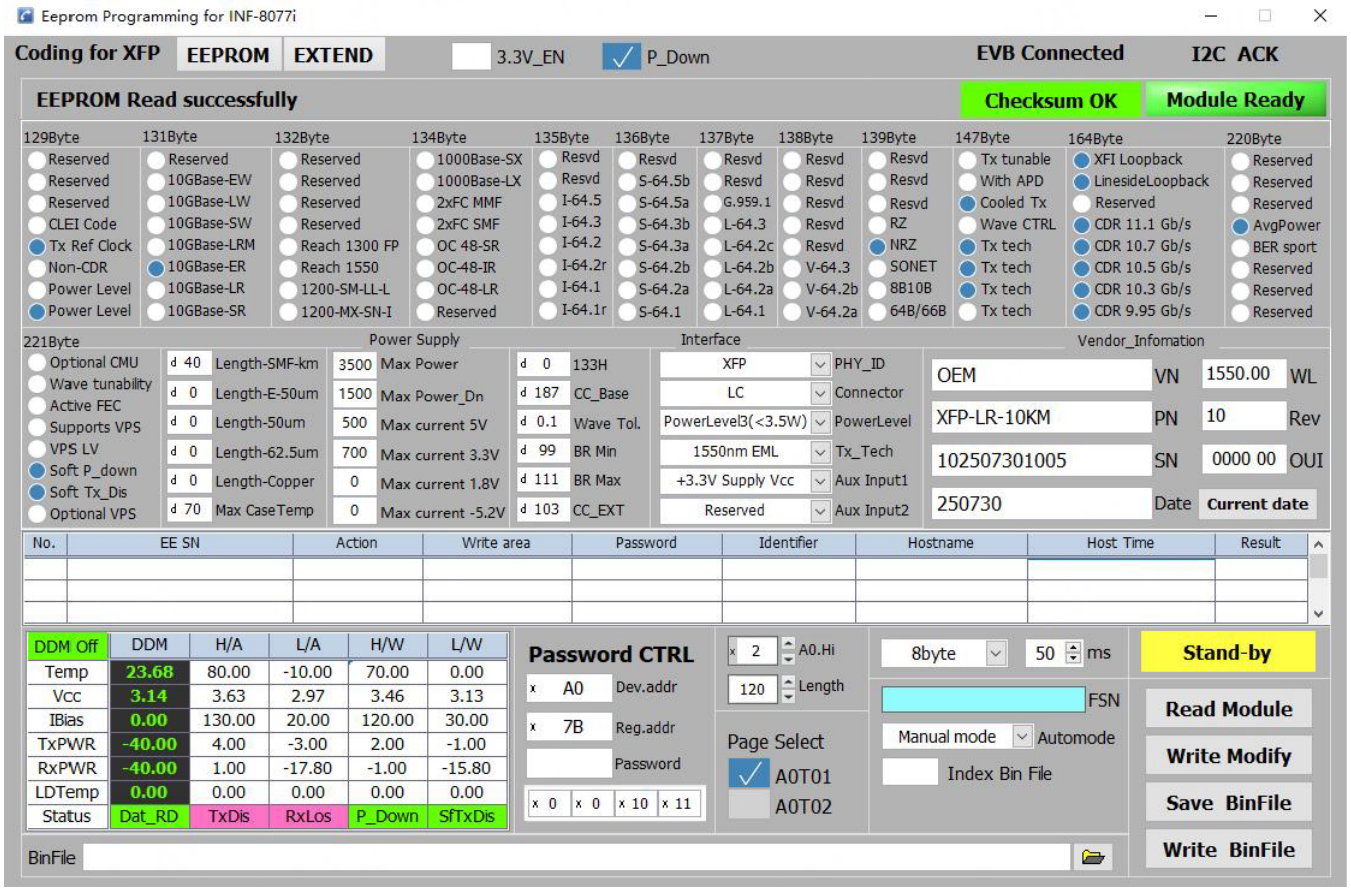
2.2 Software Operation

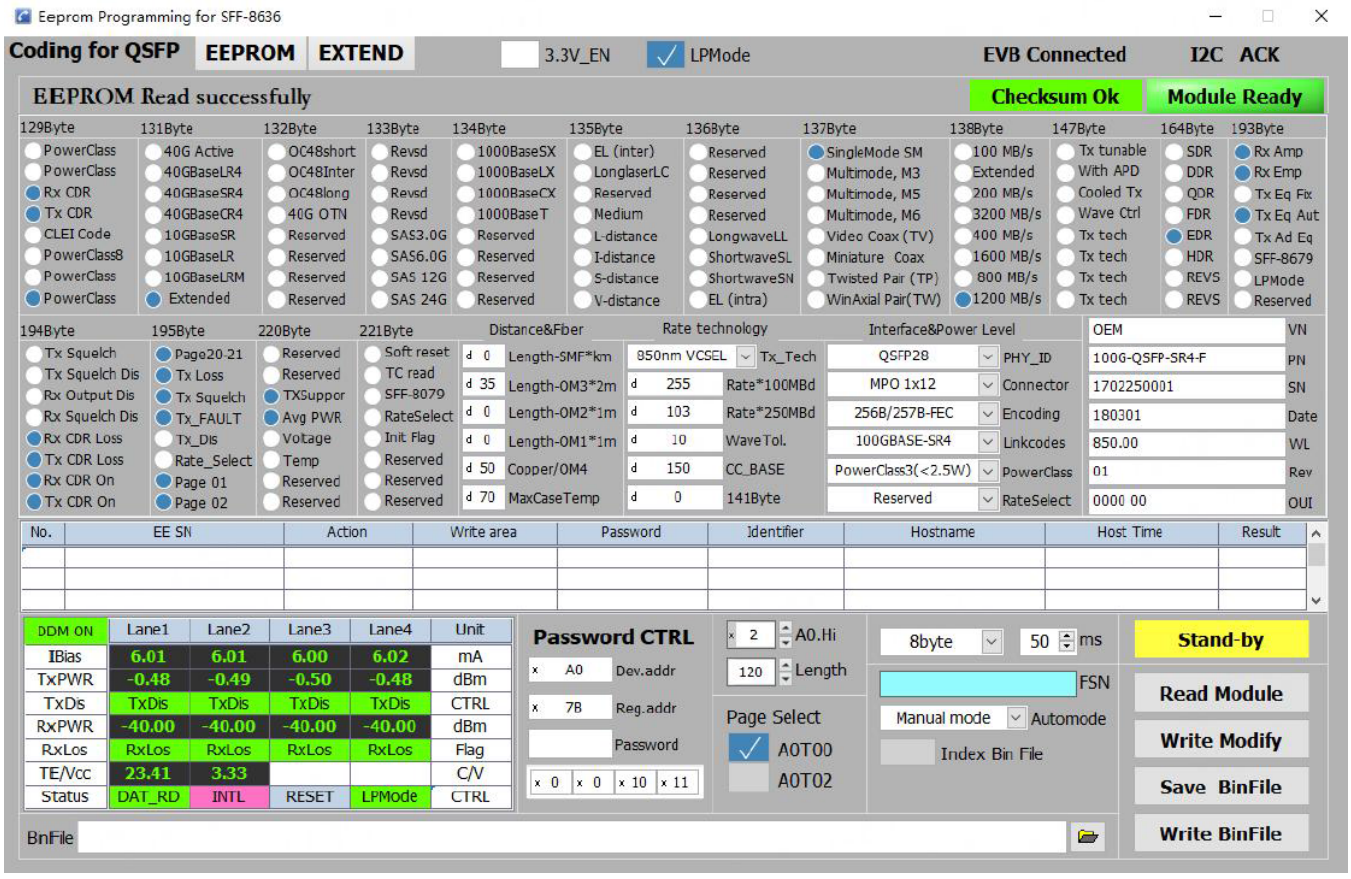
Before running this software, it is necessary to install LabVIEW2018 Run Time Engine on the computer; When running 'Coding Box-Win. exe', the software will display the following interface：

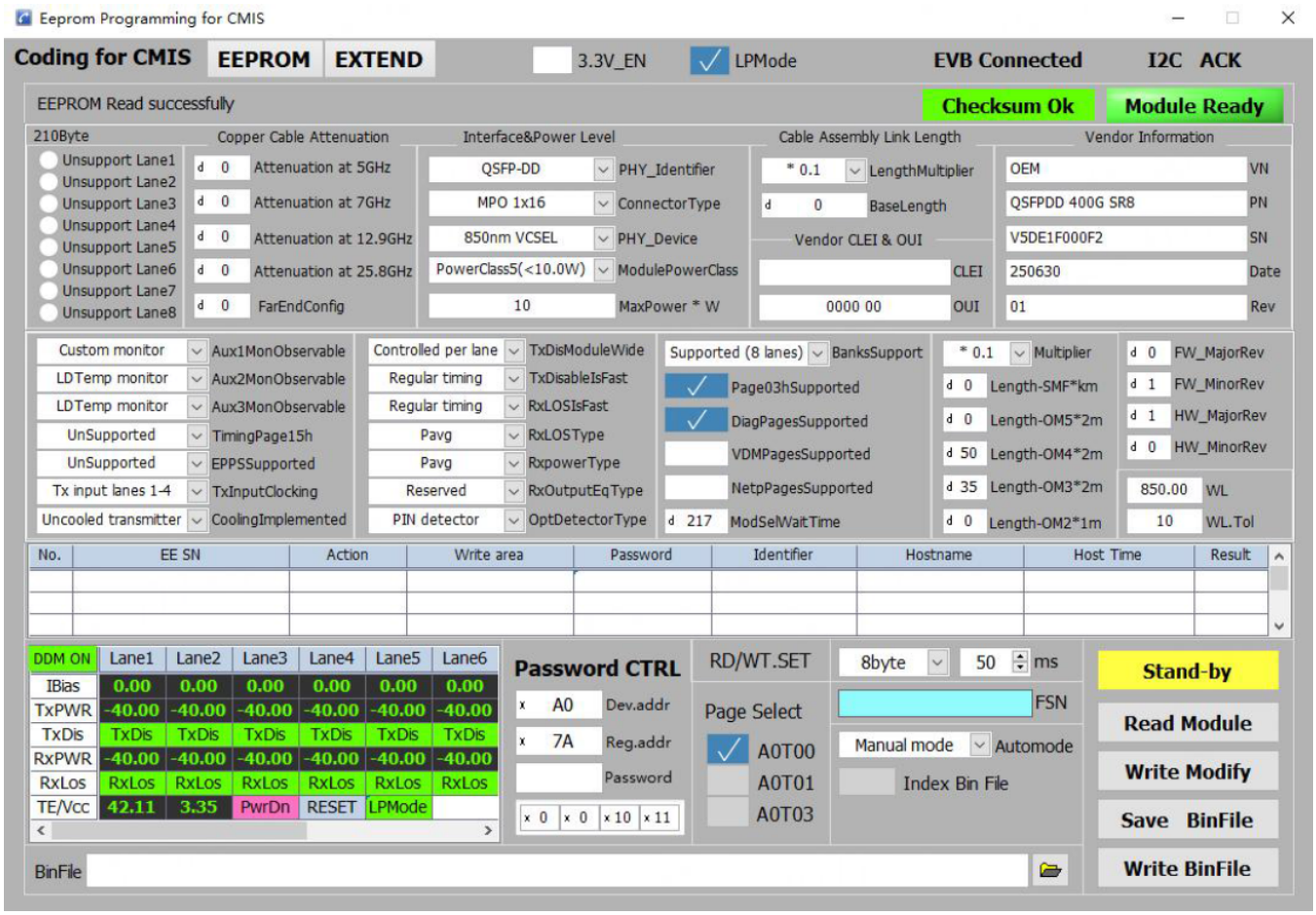


Select the packaging type of the module, click the corresponding button, and enter the coding software interface. Jump to the following picture, you can write codes and modify information for the module.


Eeprom Programming for SFF-8472
Coding For SFP
EEPROM
EXTEND
3.3V_EN
HW.Txdis
EVB Connected
I2C ACK
EEPROM Read successfully
Checksum OK
Module Ready
03Byte
04Byte
05Byte
06Byte
07Byte
08Byte
09Byte
10Byte
64Byte
65Byte
92Byte
93Byte
Interface
Distance&Fiber
Rate technology
Vendor_Infomation
PHY_ID
PHY_EXT
Connector
Encoding
8472Rev
9um-SMF
50um-OM2
62.5um-OM1
Copper/OM4
50um-OM3
Rate_ID
Extended
Rate*100MBd
Rate*250MBd
Rate_Min
OEM
SFP-SX-MM-F
C25GD002DA
110412
VN
PN
SN
Date
WL
Rev
OUI
Current date
850.00
1.0
0000 00
No.
EE_SN
Action
Write area
Password
Identifier
Hostname
Host Time
Result
DDM ON
DDM
H/A
L/A
H/W
L/W
Temp
Vcc
IBias
TxPWR
RxPWR
LDTemp
TECIcc
Status
20.02
3.30
0.00
-Inf
-40.00
1.00
2278.30
Dat_RD
TxDis
RxLos
TxFault
SfTxDis
Password CTRL
Dev.addr
Reg.addr
Password
A2
7B
A2Page
Length
Page Select
A0Low
A0T00
A2T00
8byte
ms
FSN
Manual mode
Automode
Index Bin File
Stand-by
Read Module
Write Modify
Save BinFile
Write BinFile
BinFile

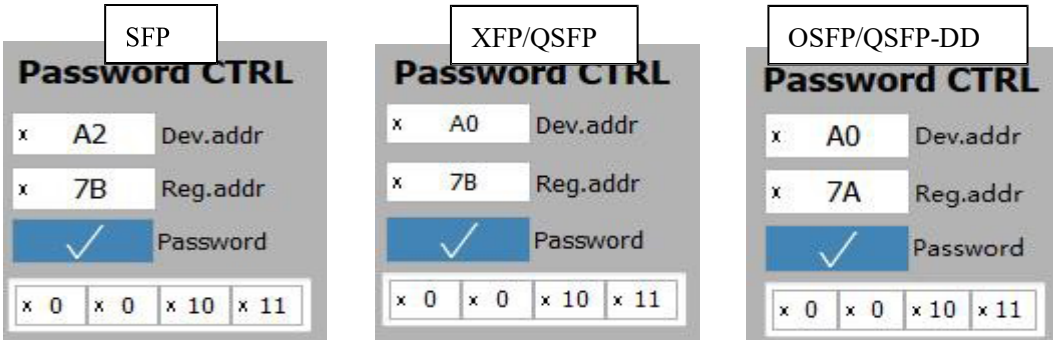

Eeprom Programming for INF-8077i
Coding for XFP
EEPROM
EXTEND
3.3V_EN
P_Down
EVB Connected
I2C ACK
EEPROM Read successfully
Checksum OK
Module Ready
129Byte
131Byte
132Byte
134Byte
135Byte
136Byte
137Byte
138Byte
139Byte
147Byte
164Byte
220Byte
221Byte
Power Supply
Interface
Vendor_Infomation
Length-SMF-km
Length-E-50um
Length-50um
Length-62.5um
Length-Copper
Max CaseTemp
Max Power
Max Power_Dn
Max current 5V
Max current 3.3V
Max current 1.8V
Max current -5.2V
133H
CC_Base
Wave Tol.
BR Min
BR Max
CC_EXT
PHY_ID
Connector
PowerLevel
Tx_Tech
Aux Input1
Aux Input2
OEM
XFP-LR-10KM
102507301005
250730
VN
PN
SN
Date
WL
Rev
OUI
Current date
1550.00
10
0000 00
No.
EE SN
Action
Write area
Password
Identifier
Hostname
Host Time
Result
DDM Off
DDM
H/A
L/A
H/W
L/W
Temp
Vcc
IBias
TxPWR
RxPWR
LDTemp
Status
23.68
3.14
0.00
-40.00
-40.00
0.00
Dat_RD
TxDis
RxLos
P_Down
SfTxDis
Password CTRL
Dev.addr
Reg.addr
Password
A0
7B
A0.Hi
Length
Page Select
A0T01
A0T02
8byte
ms
FSN
Manual mode
Automode
Index Bin File
Stand-by
Read Module
Write Modify
Save BinFile
Write BinFile
BinFile


Eeprom Programming for SFF-8636
Coding for QSFP
EEPROM
EXTEND
3.3V_EN
LPMode
EVB Connected
I2C ACK
EEPROM Read successfully
Checksum Ok
Module Ready
129Byte
131Byte
132Byte
133Byte
134Byte
135Byte
136Byte
137Byte
138Byte
147Byte
164Byte
193Byte
194Byte
195Byte
220Byte
221Byte
Distance&Fber
Rate technology
Interface&Power Level
OEM
VN
100G-QSFP-SR4-F
PN
1702250001
SN
180301
Date
850.00
WL
01
Rev
0000 00
OUI
No.
EE SN
Action
Write area
Password
Identifier
Hostname
Host Time
Result
DDM ON
Lane1
Lane2
Lane3
Lane4
Unit
IBias
TxPWR
TxDis
RxPWR
RxLos
TE/Vcc
Status
Password CTRL
Dev.addr
Reg.addr
Password
A0.Hi
Length
Page Select
A0T00
A0T02
8byte
ms
FSN
Manual mode
Automode
Index Bin File
Stand-by
Read Module
Write Modify
Save BinFile
Write BinFile
BnFile


Eeprom Programming for CMIS
Coding for CMIS
EEPROM
EXTEND
3.3V_EN
LPMode
EVB Connected
I2C ACK
EEPROM Read successfully
Checksum Ok
Module Ready
210Byte
Copper Cable Attenuation
Interface&Power Level
Cable Assembly Link Length
Vendor Information
OEM
VN
QSFPDD 400G SR8
PN
V5DE1F000F2
SN
250630
Date
01
Rev
Vendor CLEI & OUI
CLEI
OUI
DDM ON
Lane1
Lane2
Lane3
Lane4
Lane5
Lane6
IBias
TxPWR
TxDis
RxPWR
RxLos
TE/Vcc
Password CTRL
Dev.addr
Reg.addr
Password
RD/WT.SET
Page Select
A0T00
A0T01
A0T03
8byte
ms
FSN
Manual mode
Automode
Index Bin File
Stand-by
Read Module
Write Modify
Save BinFile
Write BinFile
BinFile

2.3 Module Password Management

2.3.1 Enter a four-digit hexadecimal password and set a password entry point (for example, QSFP module, default password entry is A0. [7B~7E], Set Dev.addr=0xA2 and Reg.addr=0x7B)
2.3.2 Select "Password" option. After inserting the module into the Coding Box, the coding software will automatically write the password into the module, as the following picture.

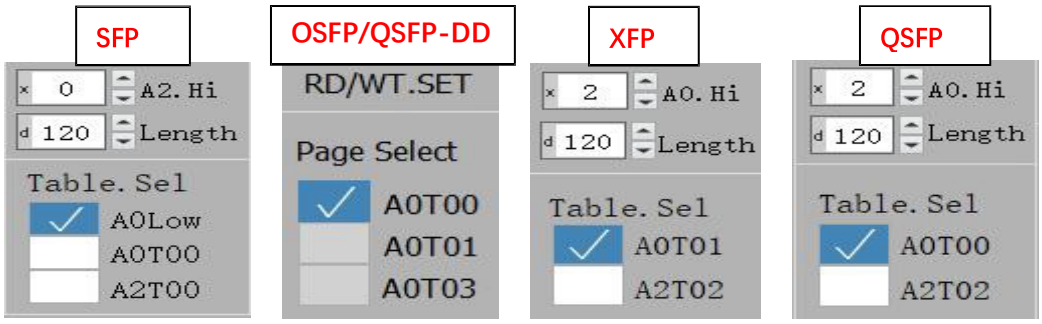


Note 3: Unencrypted optical module no need to set password, do not select "Password", just skipping.

2.4 Set the target page for writing to the module EEPROM

2.4.1 Page is defined as follows
A0Low：A0LowPage [000-128]Bytes； A0T00：A0.Page00 [128-255]Bytes；
A0T01：A0.Page01 [128-255]Bytes； A0T02：A0.Page02 [128-255]Bytes；
A0T03：A0.Page03 [128-255]Bytes； A2T00：A2.Page00 [128-255]Bytes；

2.4.2 Users can set the Page to be written according to the actual situation. The default settings are as below：



2.5 Select the code file to write

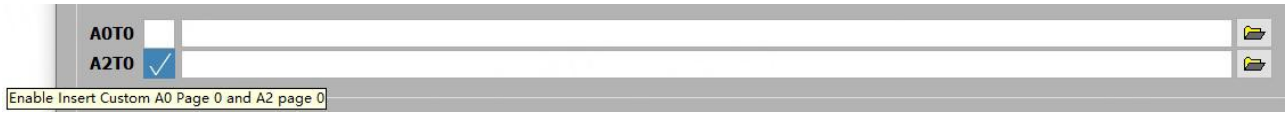
Click the file button 

Select a Bin file or drag it into the file path bar, and the software will read the content of the selected Bin file;

2.6 Insert Custom High Bit Code

A0 code and A2 code are separate code files, and the function of inserting custom high bit codes can be used to write A0 and A2 codes at once; Ignoring this function when writing a single code file.

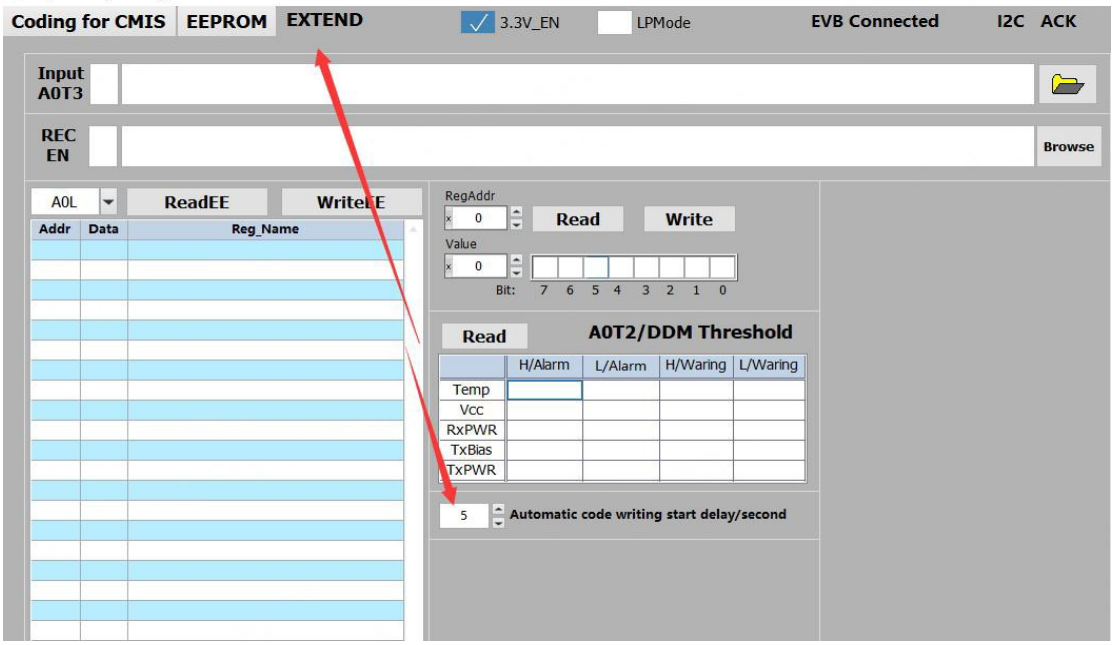
2.6.1 Place a 128byte A2/A0 high bit code, Select the A0T0/A2T0 option to enable inserting custom codes.



2.6.2 Click the file button to select the Bin file or drag the Bin file into the file path bar. When writing, the content of the Bin file selected by the software is written into the module;

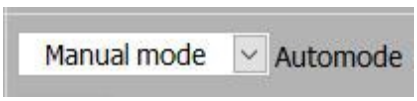
2.7 Automatic code writing delay setting

QSFP56, QSFP-DD, OSFP and other high-speed and high-power modules take a long time to start up. If the module is inserted and the code is written immediately, the code writing may fail; When writing code, you need to add enough delay Times (The specific delay time is related to the module design.) and wait for the module to enter a stable state before writing code.

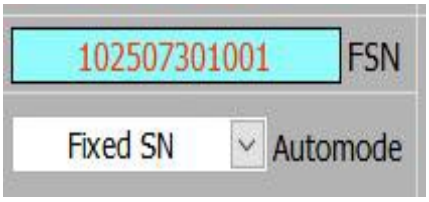


2.8 Nine coding methods

2.8.1 Manual coding mode:
2.8.1.1 Click on the "Auto Mode" option bar and select "Manual mode";
2.8.1.2 Load code file (refer to operation 2.5);
2.8.1.3 Click the "Write Bin file" button, and the software will write the information of the selected Bin file into the selected table;

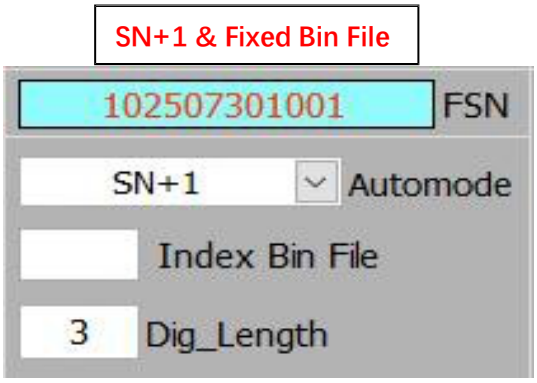


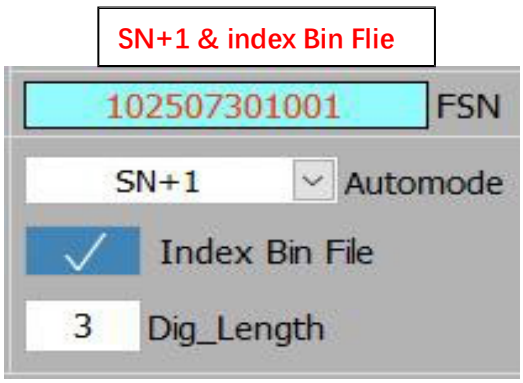
2.8.2 Automatic code writing → fixed SN mode:
2.8.2.1 Click on the "Auto Mode" option bar and select "Fixed SN";
2.8.2.2 Load code file (refer to operation 2.5), Enter SN in the FSN text box;
2.8.2.3 Insert the optical module and the software automatically triggers the Write Bin file operation after detecting successful i2C communication.
2.8.2.4 After the code writing is successful, the FSN remains unchanged.
2.8.2.5 Write code for the next module repeat the 2.8.2.3 operation.



2.8.3 Automatic code writing→SN+1 mode:
2.8.3.1 Click on the "Auto Mode" option bar and select "SN+1";
2.8.3.2 Load code file (refer to operation 2.5), Enter SN in the FSN text box;
2.8.3.3 Insert the optical module and the software automatically triggers the Write Bin file operation after detecting successful i2C communication.
2.8.3.4 After the code writing is successful, the FSN automatically increases by 1, if the code writing fails, the FSN remains unchanged.
2.8.3.5 Write code for the next module repeat the 2.8.3.3 operation.

2.8.4 Automatic coding→SN+1 & index bin file mode:
2.8.4.1 Click on the "Auto Mode" option bar and select "SN+1", Check "Index Bin File";
2.8.4.2 Load code file (refer to operation 2.5), Enter SN in the FSN text box;
2.8.4.3 Insert the optical module, the software detects that the i2C communication is successful, The 'Bin file' control automatically loads Bin files with the same name as FSN in the selected folder, and triggers the Write Bin file operation;
2.8.4.4 After the code writing is successful, the FSN automatically increases by 1, if the code writing fails, the FSN remains unchanged.
2.8.4.5 Write code for the next module repeat the 2.8.4.3 operation.





2.8.5 Scan Barcode to write → Fixed Bin file mode:

2.8.5.1 Click on the "Auto Mode" option bar and select "Scan Barcode";

2.8.5.2 Load code file (refer to operation 2.5);

2.8.5.3 Insert the optical module, scan the barcode SN to FSN with the barcode scanner, and trigger the Write Bin file operation;

2.8.5.4 After the code writing is successful, the FSN is automatically selected and cleared, if the code writing fails, the FSN remains unchanged.

2.8.5.5 Write code for the next module repeat the 2.8.5.3 operation.

2.8.6 Scan Barcode to write → SN index Bin file mode:

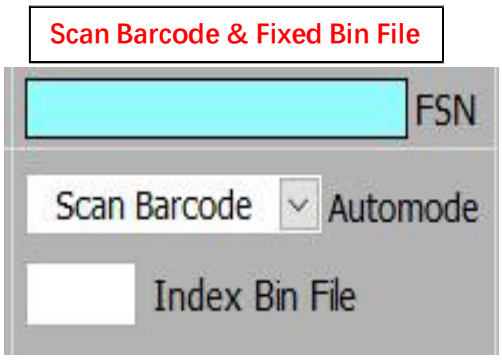
2.8.6.1 Click on the "Auto Mode" option bar and select "Scan Barcode", Check "Index Bin File";

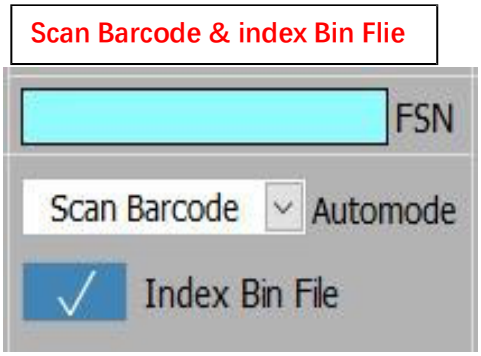
2.8.6.2 Load code file (refer to operation 2.5);

2.8.6.3 Insert the optical module, scan the Barcode SN to FSN with the barcode scanner, The 'Bin file' control automatically loads Bin files with the same name as FSN in the selected folder, and trigger the Write Bin file operation;

2.8.6.4 After the code writing is successful, the FSN is automatically selected and cleared, if the code writing fails, the FSN remains unchanged.

2.8.6.5 Write code for the next module repeat the 2.8.6.3 operation.





2.8.7 Automatic code writing→SN List mode:

2.8.7.1 Click on the "Auto Mode" option bar and select "SN List";

2.8.7.2 Load code file (refer to operation 2.5);

2.8.7.3 Insert the optical module and the software automatically triggers the Write Bin file operation after detecting successful i2C communication.

2.8.7.4 After the code writing is successful, The software automatically loads the next serial number from the serial number list to FSN, if the code writing fails, the FSN remains unchanged.

2.8.7.5 Write code for the next module repeat the 2.8.7.3 operation.

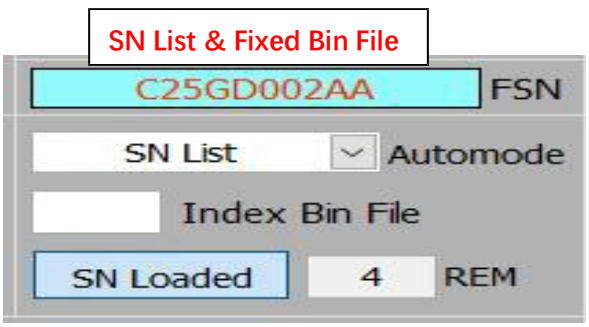
2.8.8 Automatic code writing→SN List mode & index Bin file mode:

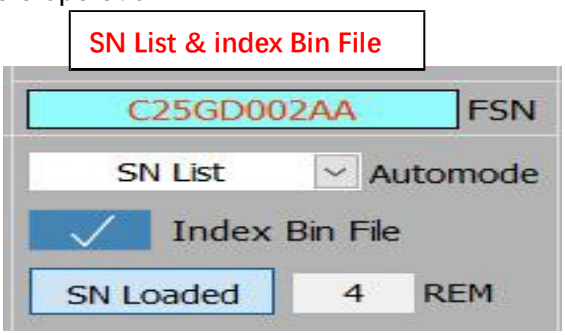
2.8.8.1 Click on the "Auto Mode" option bar and select "Scan Barcode", Check "Index Bin File";

2.8.8.2 Load code file (refer to operation 2.5);

2.8.8.3 Insert the optical module, The 'Bin file' control automatically loads Bin files with the same name as FSN in the selected folder, and trigger the Write Bin file operation;

2.8.8.4 After the code writing is successful, the software automatically loads the next serial number from the serial number list to FSN, if the code writing fails, the FSN remains unchanged.
2.8.8.5 Write code for the next module repeat the 2.8.8.3 operation.





2.8.9 Automatic code writing→Dirwalk mode:
2.8.9.1 Click on the "Auto Mode" option bar and select "Dirwalk";
2.8.9.2 Load code file (refer to operation 2.5);
2.8.9.3 Insert the optical module, The 'Bin file' control automatically loads Bin files with the same name as FSN in the selected folder, and trigger the Write Bin file operation;
2.8.9.4 After the code writing is successful, the software automatically selects the next file from the selected folder and loads the file name into FSN, If the code writing fails, the FSN remains unchanged;
2.8.9.5 Write code for the next module repeat the 2.8.9.3 operation.



2.8.7 The successful pop-up prompt reads "Writing successful, please replace the module". After unplugging the module or waiting for 10 seconds, the prompt will automatically disappear; If it fails, it will prompt "Write Code failed...".



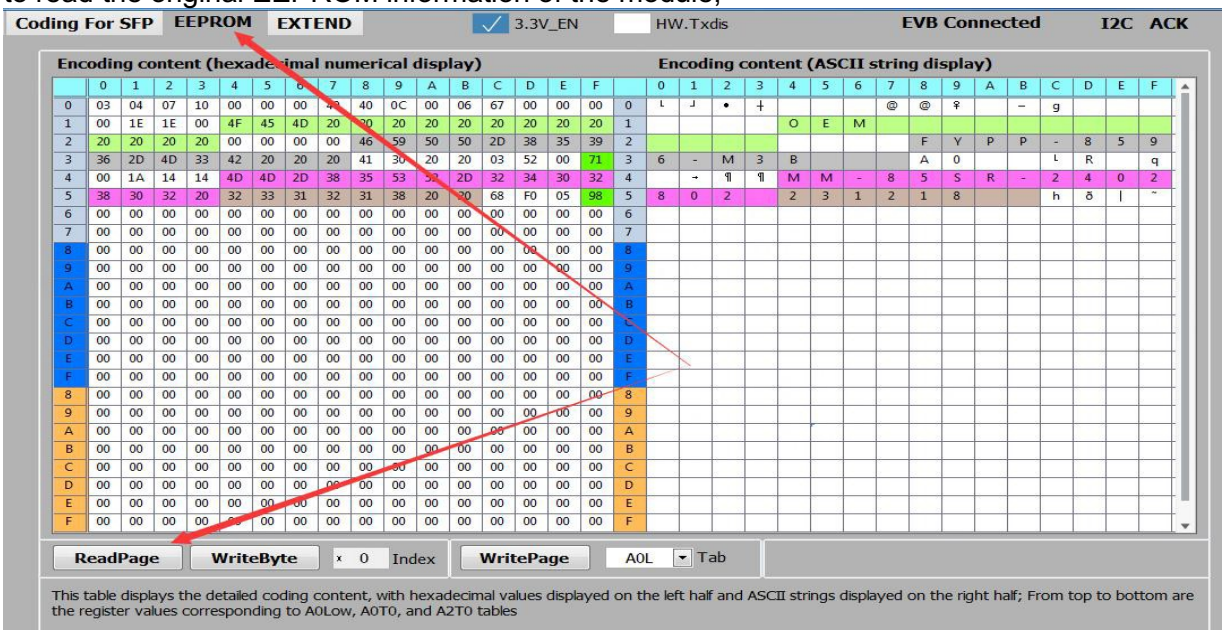
Note4: To write code in the six modes of 2.8.1-9, you need to complete 2.3 - 2.4.

2.9 Modifying Module Manufacturer Information

2.9.1 Click the "Read Module" button to read the original manufacturer information of the module;
2.9.2 Set the information that needs to be modified in the software interface, such as VN, PN, SN, date, wavelength, etc.;
2.9.3 Click the "Write Modify" button to save the currently modified information;

2.10 Custom modification module EEPROM information

2.10.1 Click the "EEPROM" button to switch to the EEPORM interface, click the "ReadPage" button to read the original EEPROM information of the module;



2.10.2 Click Table (hexadecimal value in the left half; ASCII format string in the right half) to select the cells that need to be edited and modify the data;
2.10.3 Click the “Write Byte” button to save the data edited in the current cell;
2.10.4 Click the "Write Page" button to save all data in the Table (control Pg. Sel sets the saving range);

2.11 Save Code Information

2.11.1 Click the "Read EEPROM" button to read out the original EEPROM information of the module, and select the table that needs to be saved;
2.11.2 Click the "Save Bin file" button, and the software will save the retrieved code information as a Bin file.

2.12 DDM threshold reading and writing

2.12.1 Click the "Read" button to read the DDM threshold of the module;
2.12.2 Edit the thresholds in the table, such as temperature, voltage, bias current, etc.;
2.12.3 Click the “Write” button to write the modified threshold;

Read | Write | DDM Threshold

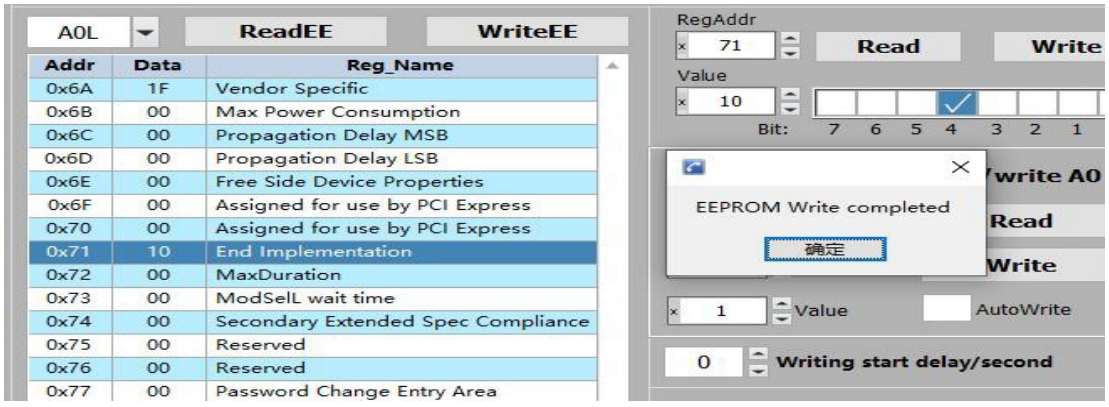
	H/Alarm	L/Alarm	H/Waring	L/Waring
Temp	100.00	-10.00	90.00	-5.00
Vcc	3.60	2.90	3.50	3.00
IBias	100.00	1.00	90.00	2.00
TxPWR	6.00	-4.00	5.00	-3.00
RxPWR	-16.93	-26.02	-8.00	-24.95
LDTemp	0.00	0.00	0.00	0.00
TEC Icc	0.00	0.00	0.00	0.00

2.13 Module EEPROM page operation

2.13.1 The module EEPROM page operation function mainly reads and writes module registers in batches. Users can edit register values in the register table. Click the Page option bar to select or manually enter the page that needs to be set, and click the "ReadEE" button. The software will read the corresponding data in the module EEPROM and load it into the register table.

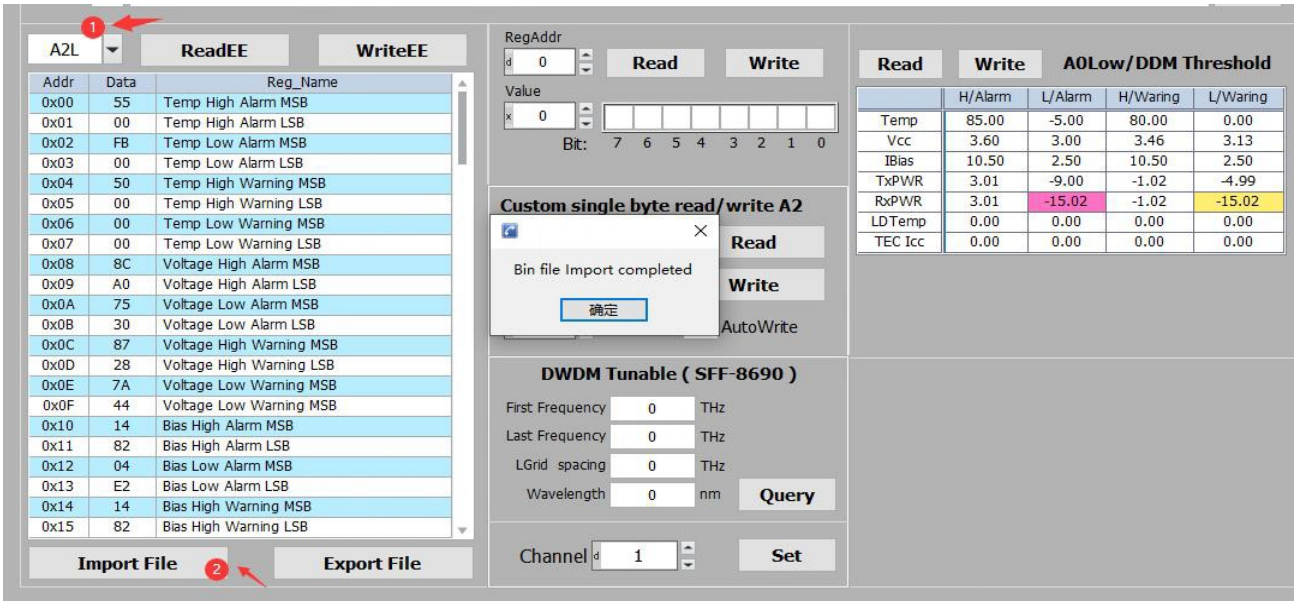


2.13.2 Click the "WriteEE" button, and the software will batch write the values in the current register table into the module registers;



2.14 Custom import and export of Bin files within the table

2.14.1Select the table to be operated on, click the "Import File" button, select the corresponding Bin file, and the software will read the data and load it into the register table. Users can edit the register values in the register table. It can also be written into the module EEPROM, refer to 2.13.2;

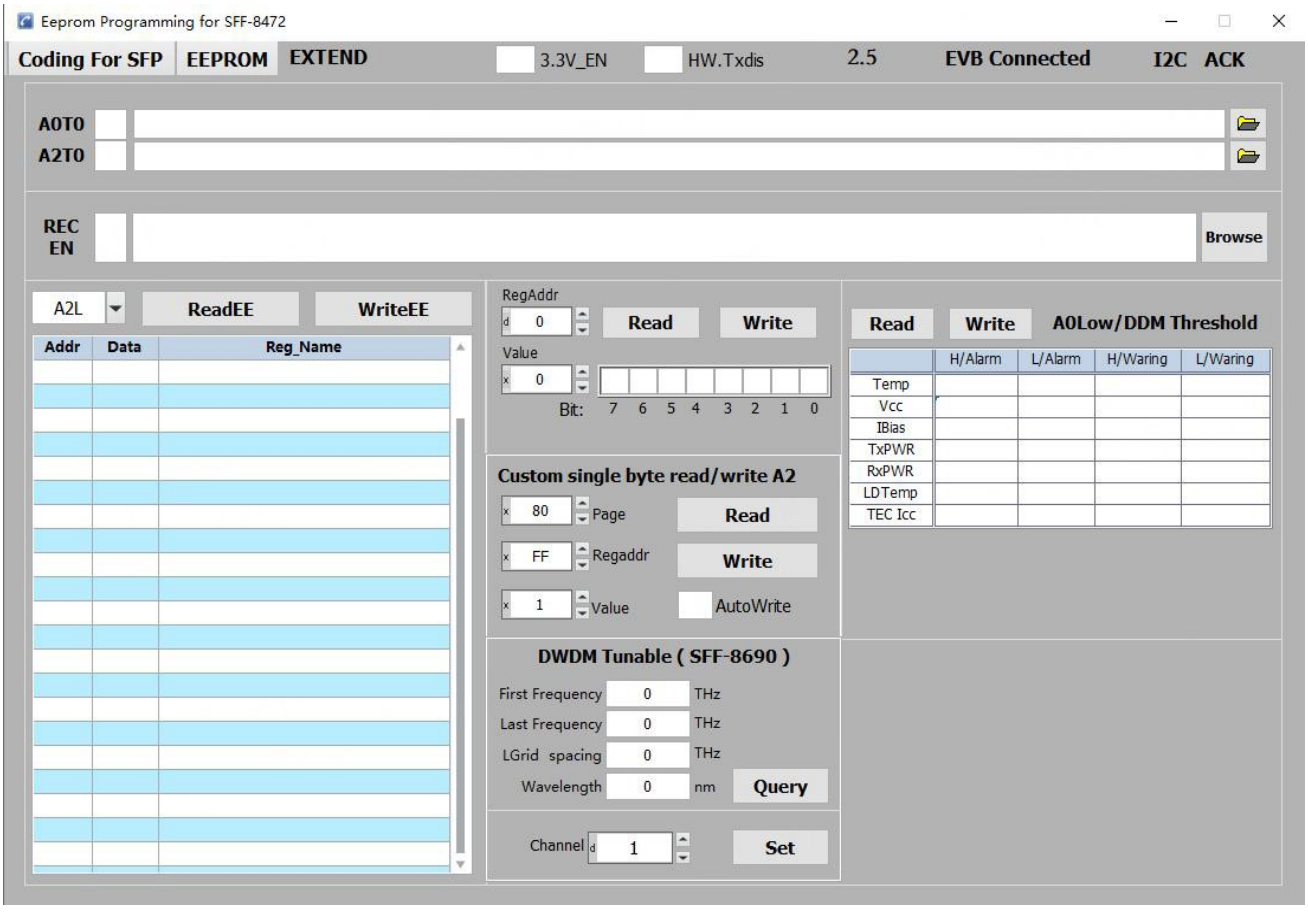


2.15.2 Click the "Export File" button, and the software will export the data in the table to a local file.

2.15 DWDM Tunable Function

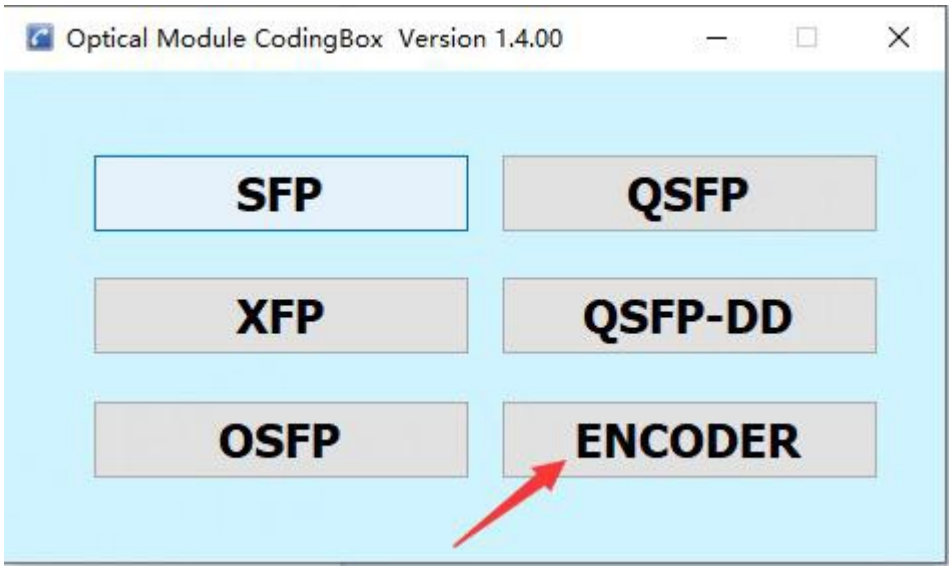
2.15.1 Click the "Query" button to query the Tunable information of the current module;

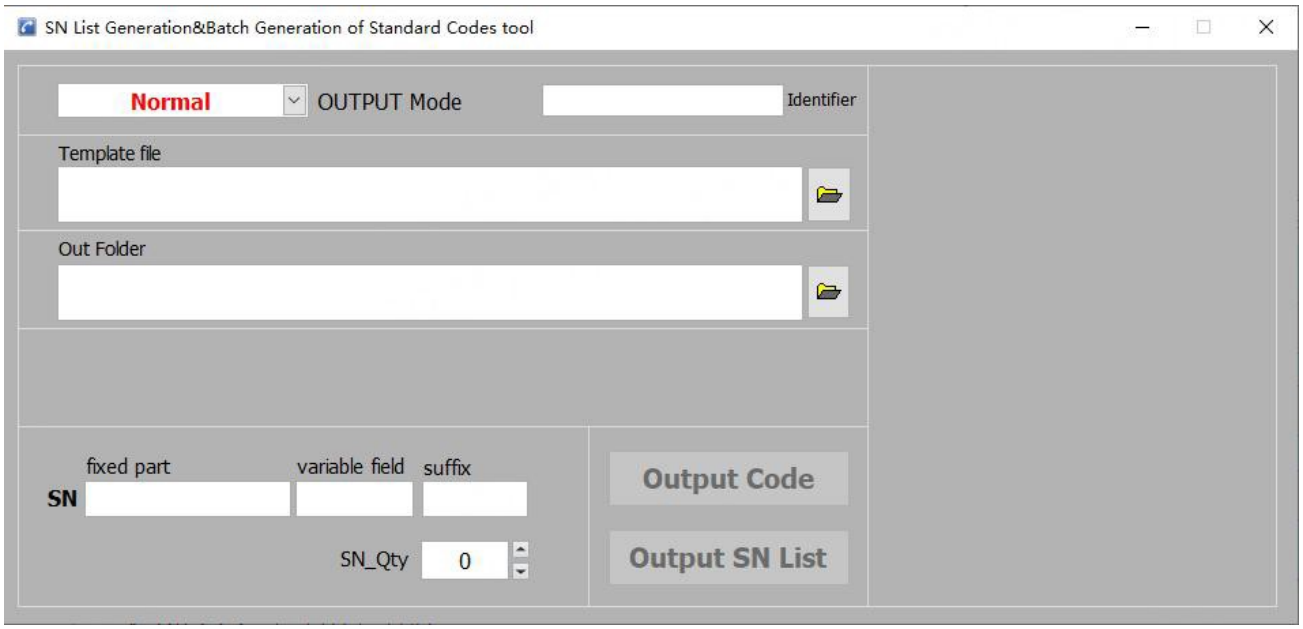
2.15.2 Enter the channel number in the Channel settings box, click the "SET" button, and the software will automatically update the relevant registers;



Part 3: Encoder

3.1 Click the "ENCODER" button to jump to the encoding sub interface as shown in the following figure



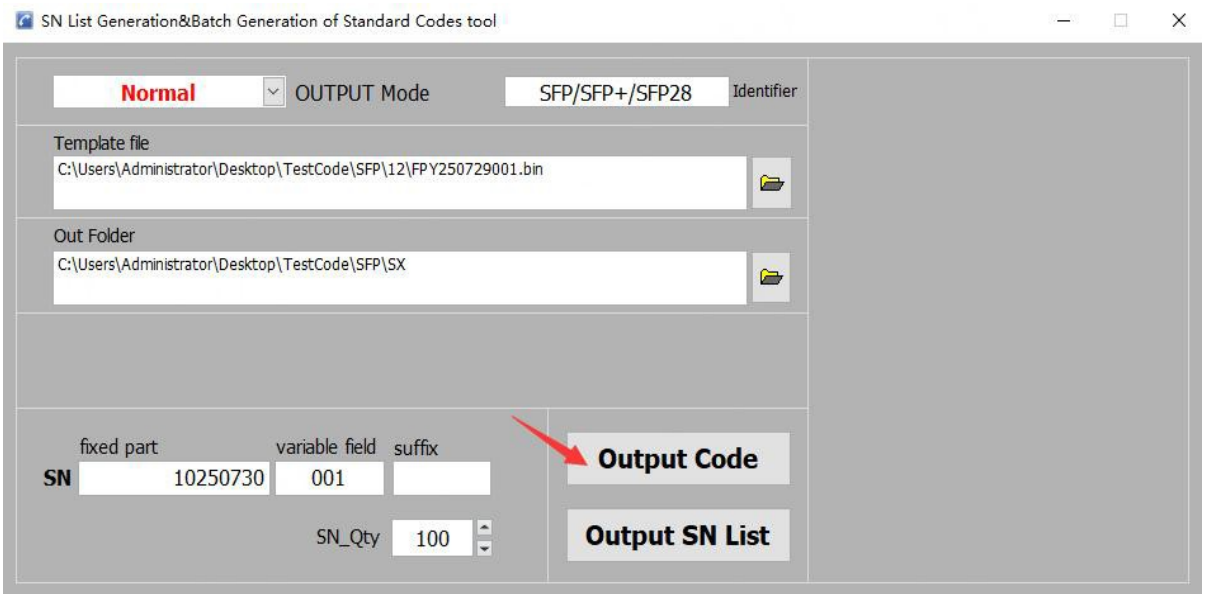


3.2 Normal mode

3.2.1 Load Template File and select Out Folder;

3.2.2 Enter the fixed prefix of SN in the Fixed Part text box, the starting serial number of SN in the Variable field text box, and the fixed suffix of SN in the Suffix text box (e.g. fixed letters, leave blank if there is no fixed suffix);

3.2.3 Click the "Output Code" button, and the software will automatically generate compatibility codes in sequence;

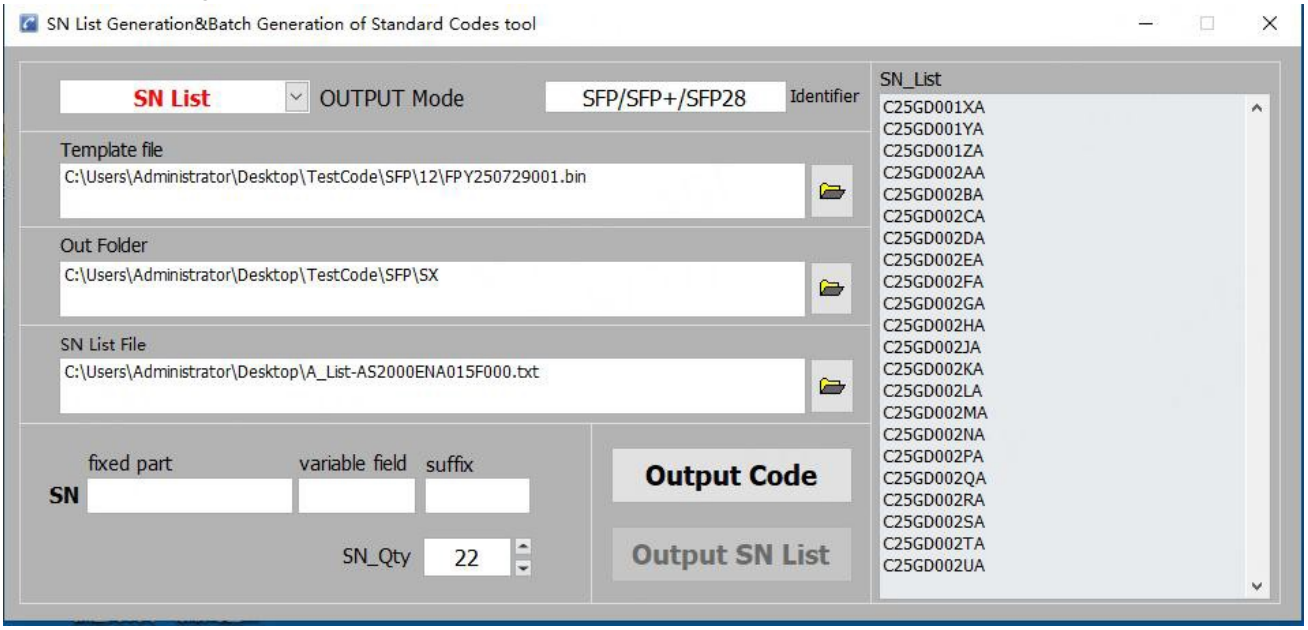


3.3 Import SN List mode

3.3.1 Click on the "Output Mode" option box, select SN List, load Template File, and choose Out Folder;

3.3.2 Load SN List File in the SN List File box;

3.3.3 Click the "Output Code" button, and the software will automatically generate compatibility codes according to the SN list;



3.4 Generate SN list

3.4.1 Click on the "Output Mode" option box and select Normal mode;

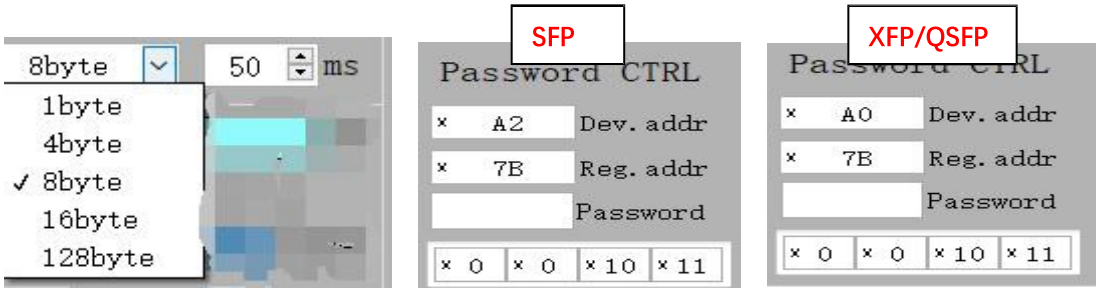
3.4.2 Enter the fixed prefix of SN in the Fixed Part text box, the starting serial number of SN in the Variable field text box, and the fixed suffix of SN in the Suffix text box (e.g. fixed letters, leave blank if there is no fixed suffix);

3.4.3 Click the 'Output SN List' button to export the SN list.

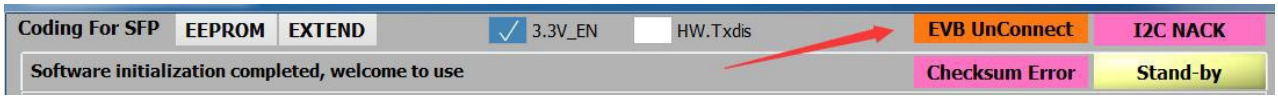
Part 4: FAQ

4.1 Coding failure

The module communication is normal, the password is also correct, but errors are still reported when re-coding or writing. At this time, you should contact the manufacturer to obtain the appropriate page size and delay settings or special password entry (the software defaults to a delay of 50ms for every 8Bytes written, which can match 95% of the optical modules on the market)



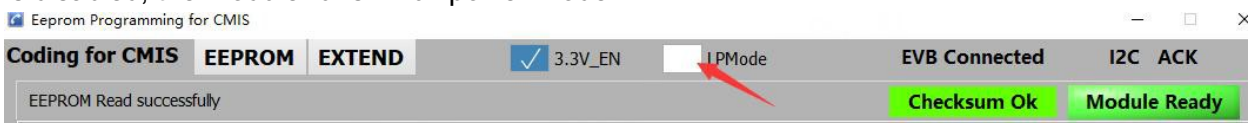
4.2 Coding Box connection failed, as shown in the picture



Check whether the Coding Box USB TYPE C cable is connected normally. If the USB connection is normal but EVB Unconnected still appears, the coding box may be down. Try re-plugging the Coding Box USB cable.

4.3 When high-speed high-power modules such as QSFP-DD and OSFP are inserted into Coding Box, I2C-NAC appears or a prompt "TWI Read Slave: A0 Failure" appears.

Check whether the low power mode is disabled. As shown in the figure below is the low power mode is disabled, the module runs in full power mode.



Try turning on low power mode, as shown in the picture below



Alternatively, connect an external high-power 5V power supply and enhance module cooling.

4.4 For high-power modules such as QSFP-DD and OSFP, automatic code writing fails when I2C access is normal.

Check the delay setting and refer to 2.7 for delay setting.