# 40G/100G QSFP AOC Checker

## Features


- 40Gbps，100Gbps ,112Gbps **BERT**
- QSFP status checker
- Friendly graphic user interface (GUI)
- 2 QSFP ports
- Working independently without PC
- 5V~12V DC power supply
- Small form &full metal case
- Mini-USB connection

## Applications

- Bit error rate test (PRBS types have four options: PRBS7, PRBS23, PRBS15 and PRBS31, default to PRBS31.)
- QSFP, QSFP+, QSFP AOC/DAC, QSFP+ AOC /DAC test
- Module power measurement
- GUI Operating environment: Win XP, Win 7, Win8 and Win10

## Description

The QSFP Checker is an instrument which can help you to test QSFP,QSFP+ module ,QSFP AOC,QSFP+ AOC,QSFP DAC,QSFP+ DAC

It can help you to read the internal memory EEPROM of the modules and display details of the EEPROM (such as the Part Number, Vendor Name, description and range.), monitor all DDM information. You can change the EEPROM if you know the module password . In addition it can measure the power of the module.

The QSFP Checker combines the Serial Pattern Generator, Bit Error Rate Analyzer. It provides common transmission rate for 40G and 100G.

The friendly graphic user interface (GUI) provides clear monitoring for bit error rate, bit

error counter, time, status, power of the module, selection of data rate and PRBS pattern.

## Working mode

1. 40GQSFP+
   In this mode, QSFP module, QSFP AOC, QSFP DAC can be tested. Two modules at the same time, one by one, single channel by single channel, all are supported.
   In addition, you can use two “QSFP Checker” if the AOC or DAC can’t be inserted into one QSFP Checker. But in this mode, two QSFP Checkers connected to one PC is not supported.

2. 100G QSFP28, 112G QSFP28
   100G QSFP28, 112G QSFP28 are used to test 100G/112G QSFP28 module, AOC, DAC
   In these two modes, only the QSFP2 Port is used, QSFP1 port is no function include DDM, power measure, read and write EEPROM. Two QSFP Checkers must be used when 100/112G QSFP28 AOC/DAC is tested. You can connect the two QSFP Checkers to two PC.

3. 100G QSFP28_ A, 112G QSFP28_A
   These two modes are only used when you connect two QSFP Checker to one PC
   Otherwise they are no function

4. Without PC
   The QSFP Checker can working independently. You can choose the work mode from the GUI and save it to the QSFP Checker (Factory setting is 40G), then the Checker can work as you wanted. The QSFP Checker will not change its working mode even if it is power down, you can get the main message from the four LED, such as working mode, Bit Error test is OK or NG. ,

## Typical applications

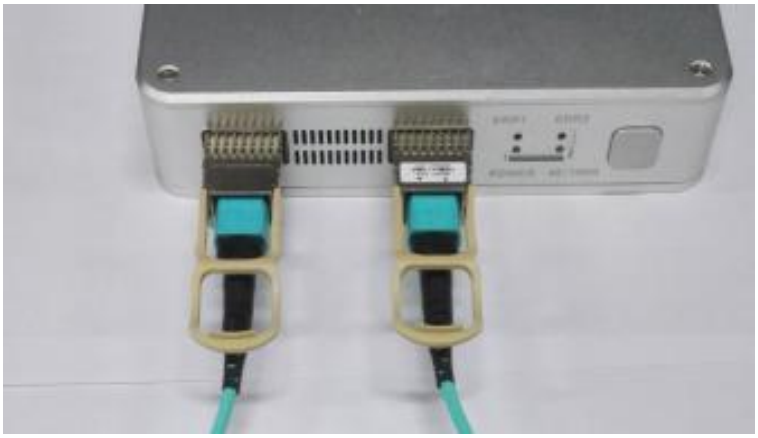
**40G QSFP Mode:**

In 40G mode, “Two QSFP Checker-One PC” is not supported

**Module test:**


**AOC or DAC test:**

Using one QSFP Checker or Two



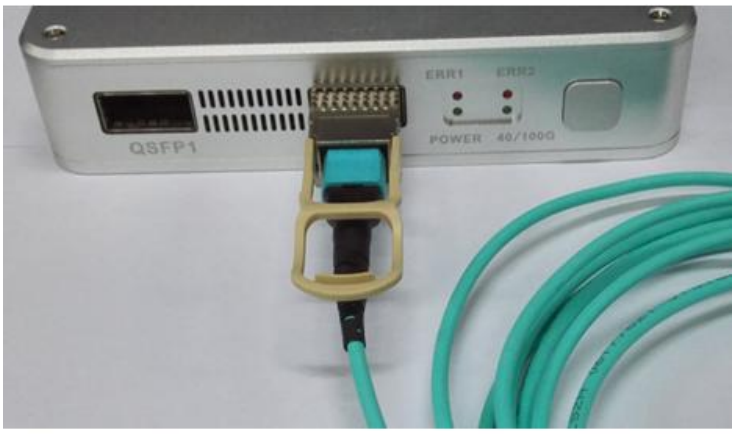
## 100/112G QSFP28, 100/112G QSFP28 AOC/DAC

### Module Test:

Only QSFP2 support 100G/112G, QSFP1 is no function


## AOC/DAC Test:

Use two “QSFP Checker”, connected to one PC, TWO PC or without PC,
Without PC, you can just know the result(PASS or NG) but no more detail.


QSFP1
ERR1
ERR2
POWER
40/100G


QSFP1
ERR1
ERR2
POWER

## Absolute Maximum Ratings

| Parameter | Symbol | Min | Max | Unit |
|---|---|---|---|---|
| Supply Voltage | Vcc | -0.5 | 16 | V |
| Storage Temperature | Ts | -10 | +70 | °C |

## Technical Specifications

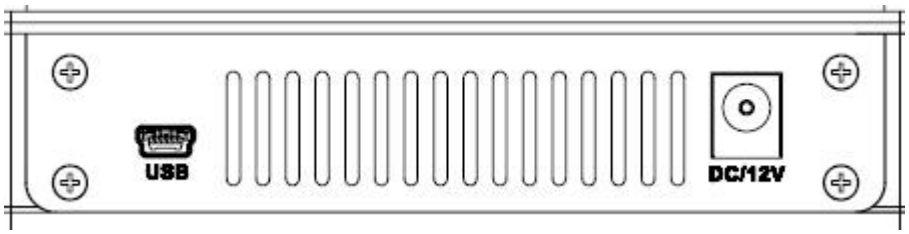
| Parameter | | Symbol | Min | Typical | Max | Unit |
|---|---|---|---|---|---|---|
| Operating Case Temperature | Standard | Tc | -10 | | +50 | °C |
| Operating Humidity | | - | 5 | | 85 non-condensing | % |
| Power Supply Voltage | | Vcc | 5 | 12 | 16 | V |
| Physical Dimensions | | | 2000(W)x1400(D) x24(H) | | | mm |

## Optical and Electrical Characteristics

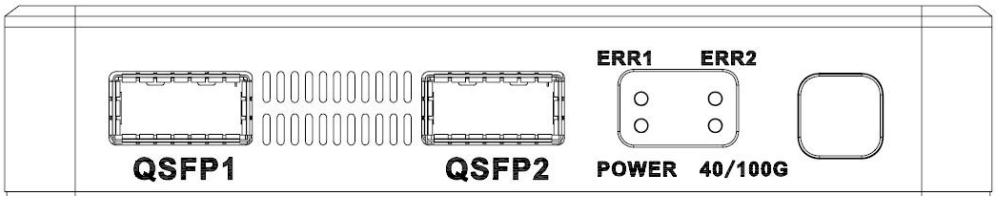
| Main Frame | |
|---|---|
| SFP ports | Standard QSFP 20pin with Cage |
| Transmission rate | 112Gbps,<br>100Gbps<br>40Gbps |
| Pattern Generator | PRBS7,PRBS9, PRBS21, PRBS23, PRBS31 |
| **Module Power measured** | |
| supply current | 0~3000mA |
| Accuracy | ±15% |

# Hardware Configuration

## 1. MINI USB and DC Power




## 2. QSFP PORTS and work status




QSFP1: only support 40G(10G single channel)
QSFP2: support 40G,100G,112G
KEY: Restart testing
LED:

ERR1: Indicates test result of QSFP1, if any one of the four channels BER(bit error of rate) is not zero, it will be red

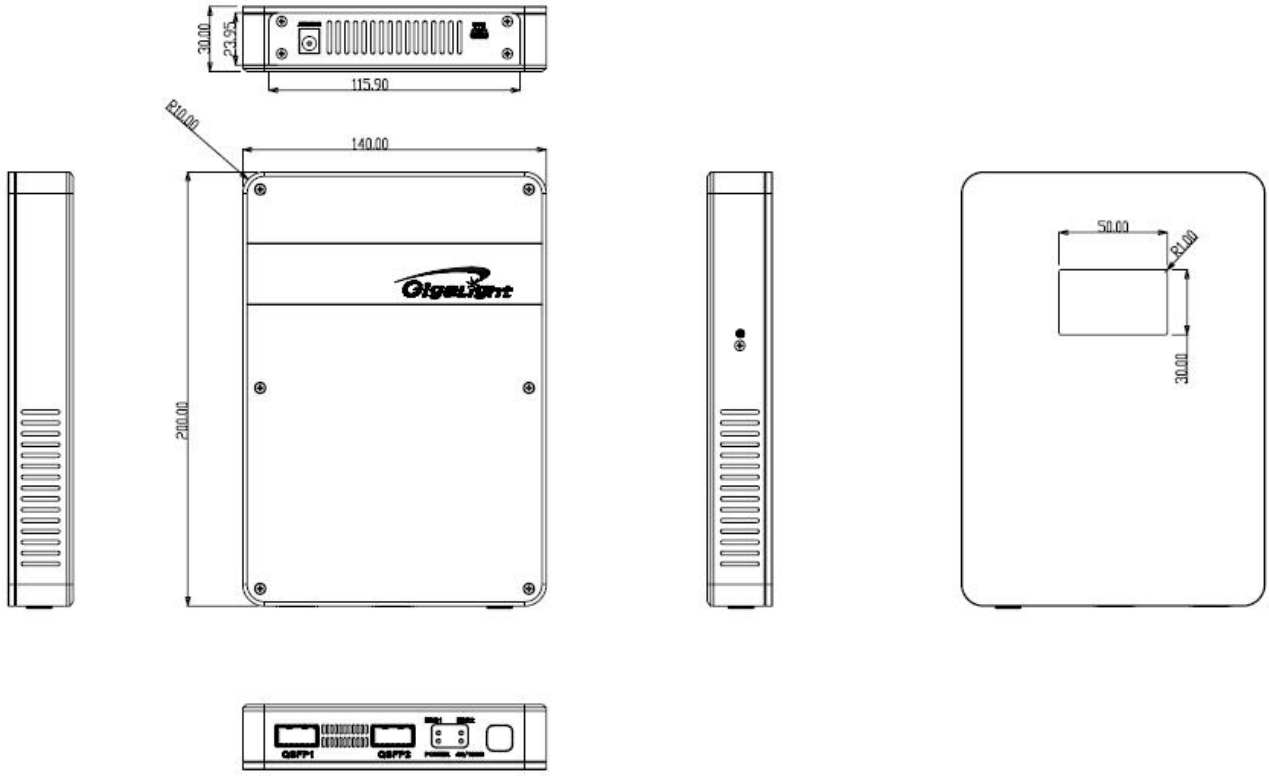
ERR2: Indicates test result of QSFP2, if any one of the four channels BER(bit error of rate) is not zero, it will be red

Power: Power indicator

40/100G: 40G: OFF
100G: ON
112G: blink

ERR1，ERR2 is no function when the “Checker” is connected to PC

# Mechanical Dimensions




## Ordering information

| Part Number | Product Description |
|---|---|
| 40G/100G QSFP AOC CHECKER | The QSFP Checker is an test instrument which combines 112Gbps,100Gbps,40Gbps Bit error rate test, DDM Checking, EEPROM coding function, etc. |

## Important Notice

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# User Guide

## Hardware Configuration

**Front panel:**


| Mode | Light |
|---|---|
| 40G | Off |
| 100G | On |
| 112G | Flash |

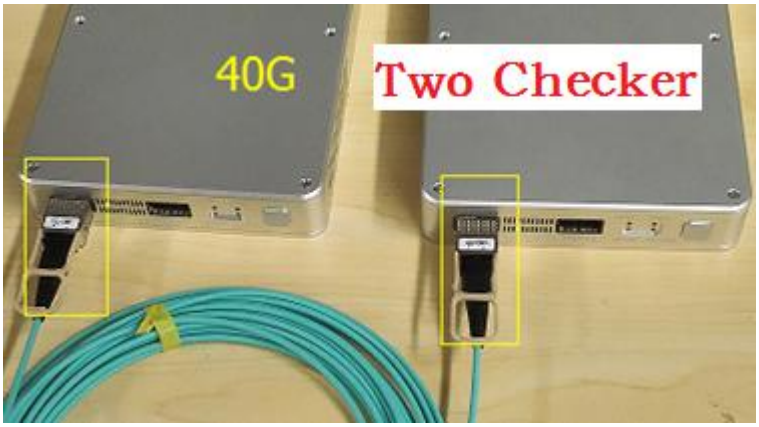
Note:only QSFP2 port supports three data rates

**Rear panel:**


## Device Connection

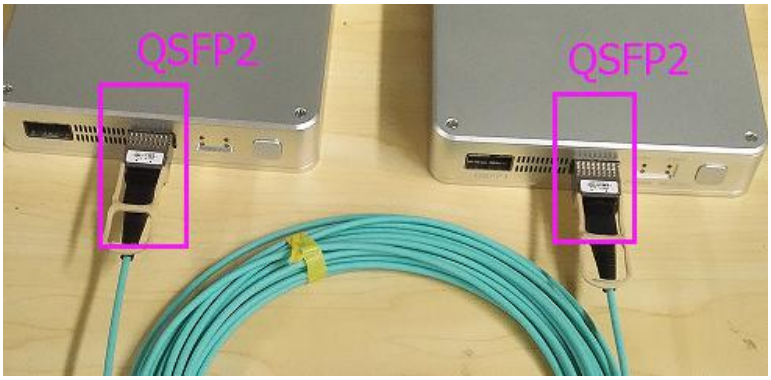
## One Checker for 40G AOC&DAC Test

## Two Checkers for 40G AOC&DAC Test




Note: One end module of AOC&DAC connected to one port of one checker, another end module connected to one port of another checker.

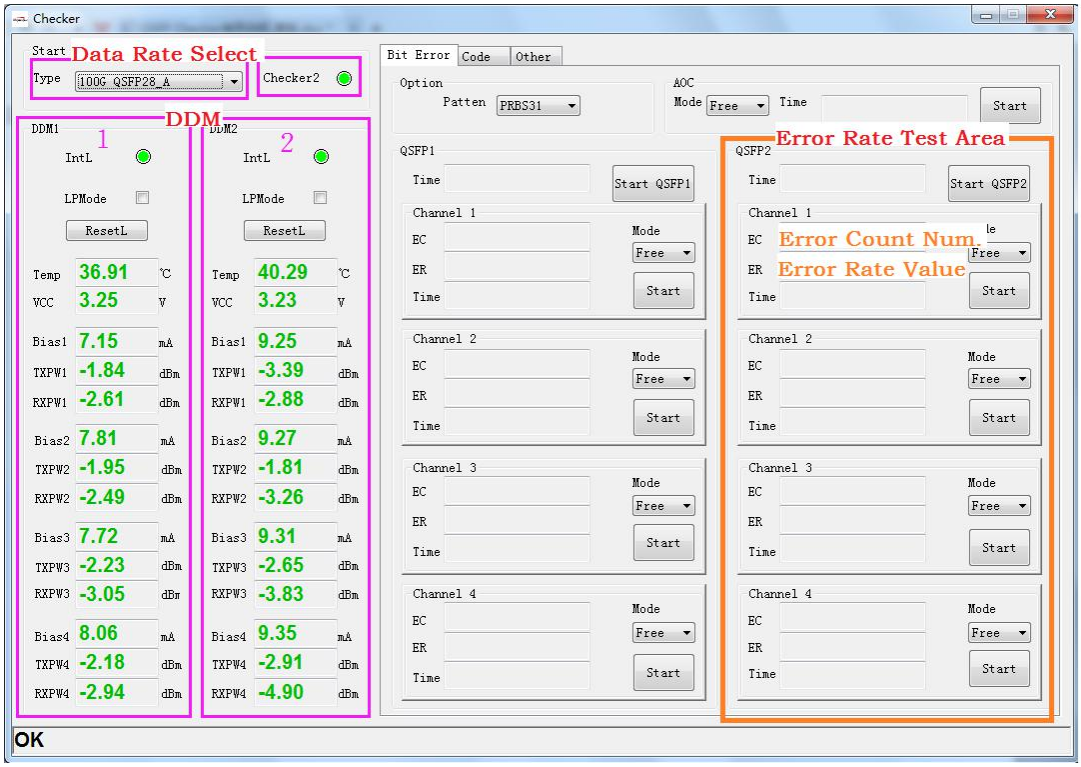
## Two Checkers for 100/112G AOC&DAC Test




Note: Now the two checkers are connected to PC with USB cable.

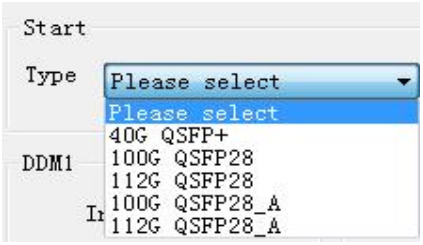
# Software Function Introduction

## Bit Error




The software interface as shown above, separately introduced as follow:

## 2.1.1.Data Rate Selection:



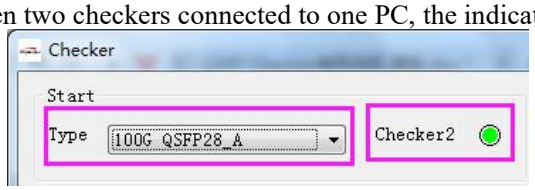

When there are two checkers to do Bit Error test on 100G/112G AOC/DAC,

1) If the two checkers are connected to one PC with separate USB cables, choose 100G/112G QSFP28_A;

2) If the two checkers are connected to separate PCs , choose 100G/112G QSFP28.

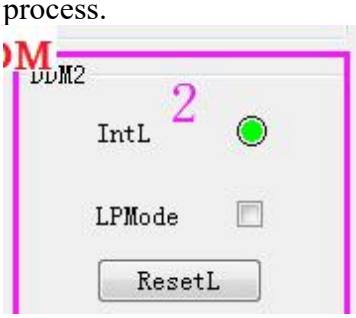
## 2.1.2. Indicator Light of Checker2

When two checkers connected to one PC, the indicator light will flash on Checker2 in Start section, as below:




## 2.1.3 DDMDisplay Section

It read and display the real-time data of the transceiver internal memory, Checker and GUI do not process.




IntL -- module malfunction warning light: red means malfunction, green means normal working;
LPMode -- low consumption mode: close each channel light of the module;
ResetL -- module restoration: DDM value reset.

## 2.1.4 BERT Section

## 2.1.4.1 PRBS Code Type Selection

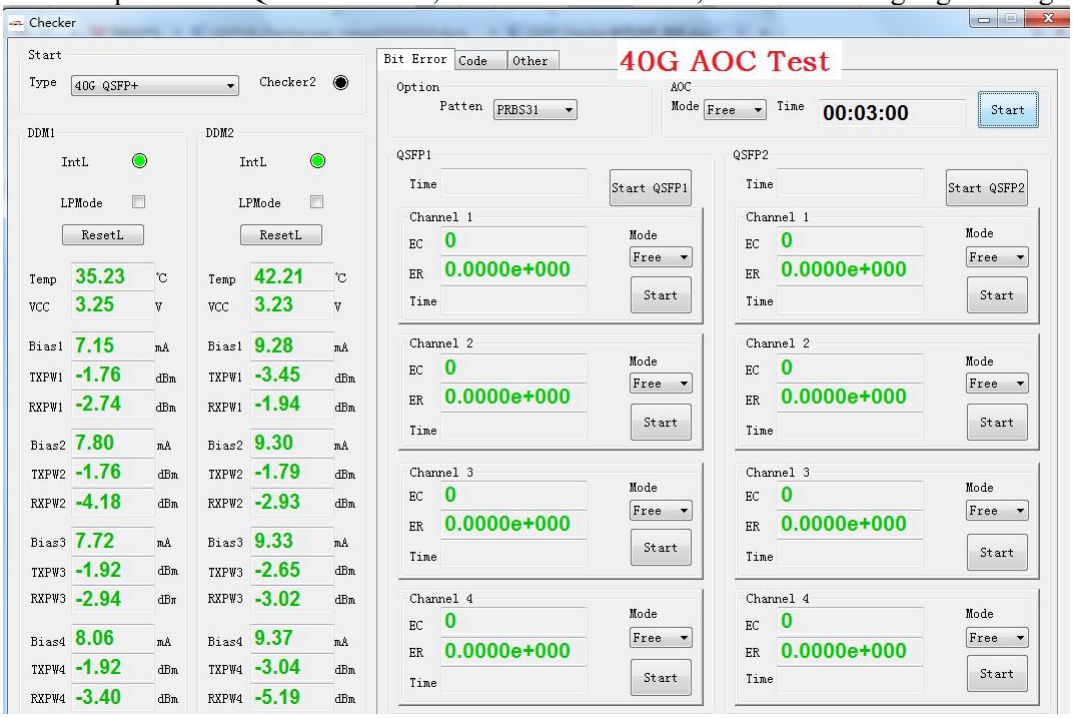

PRBS types have four options: PRBS7, PRBS23, PRBS15 and PRBS31, default to PRBS31.

## 2.1.4.2 Test Time Mode

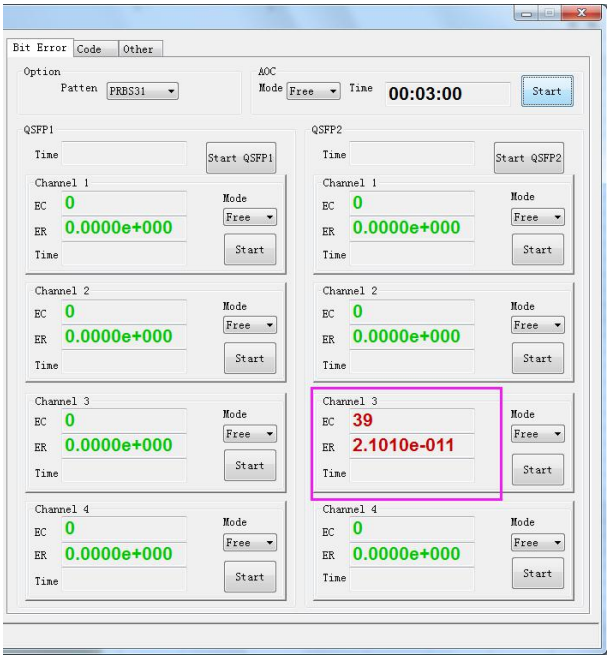

Free -- Increasing timing
Timer -- decreasing timing

## 2.1.4.3 Bit Error Rate Value

For example of 40G QSFP AOC test, if there is no bit error, the value are highlighted in green, as below:

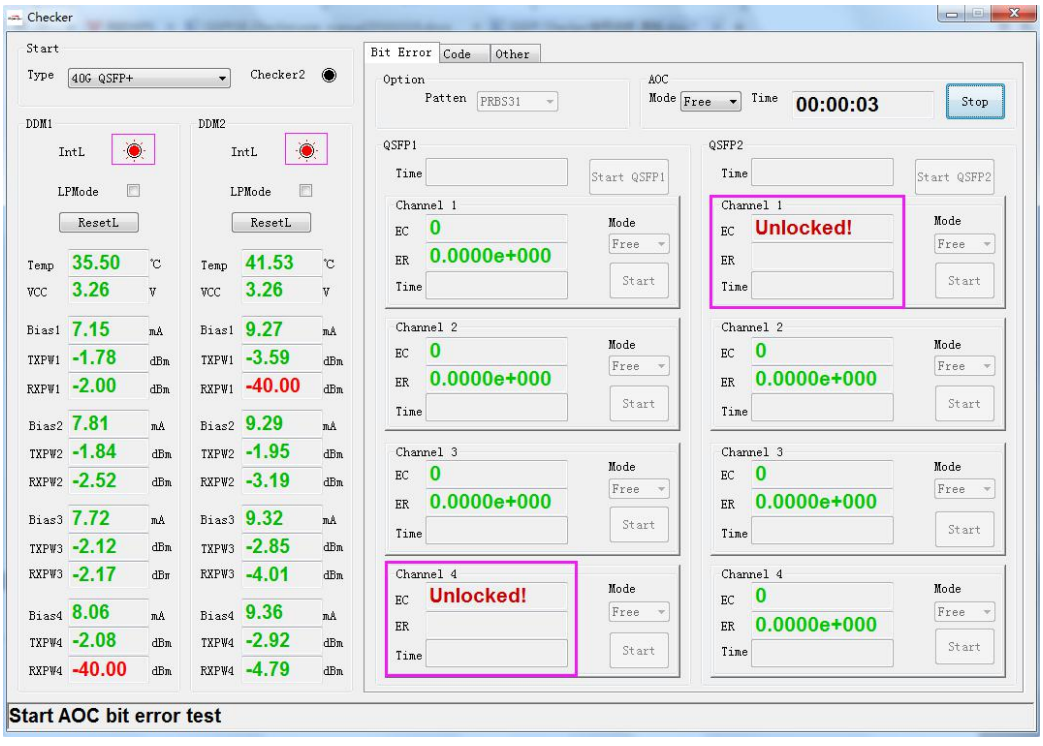



When there is bit error, the value are highlighted in red.As below shows the third channel has bit error:

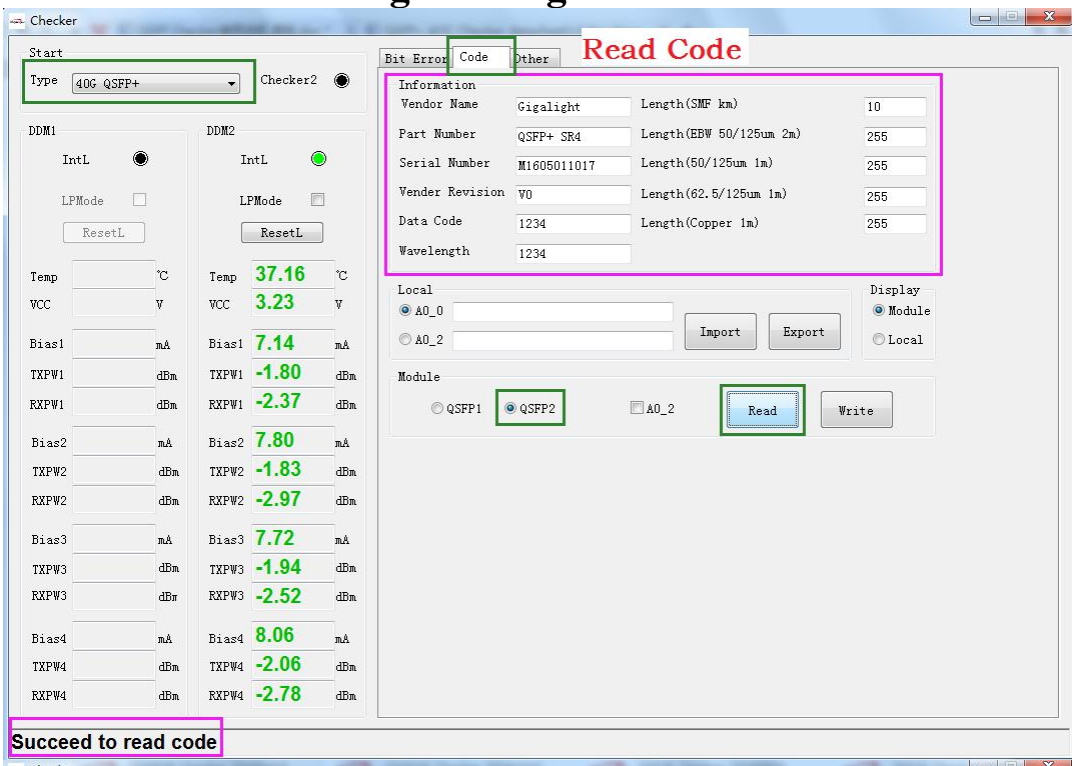


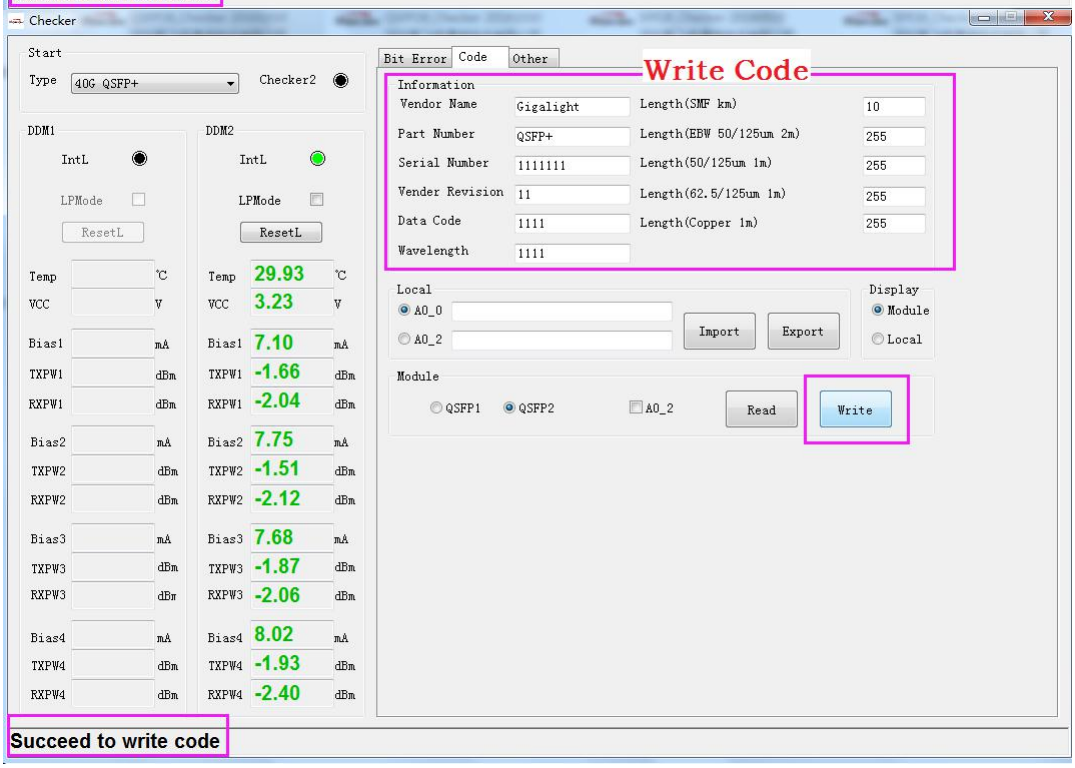

## 2.1.4.4 AOC Module Connection Failed

When the first and forth channels receive failed, IntL in DDM section will show red light, Bit Error section shows Unlocked! in red as below:

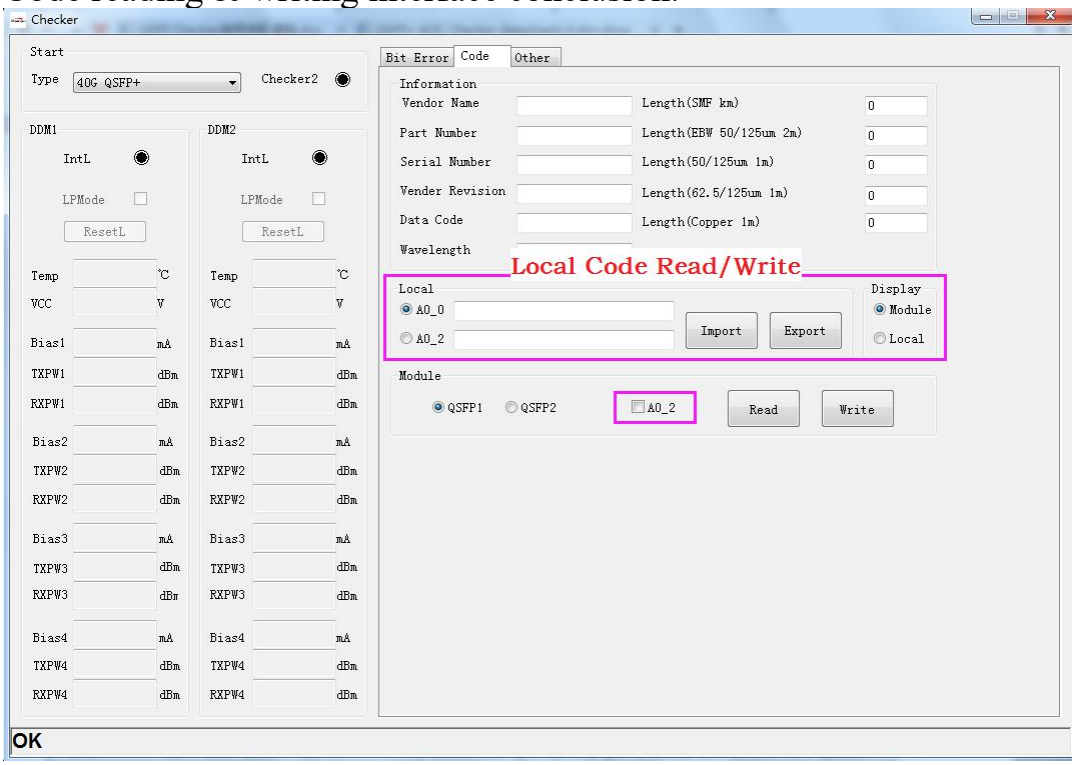


# Module Code Reading/Writing



Code reading & writing interface conclusion:




In the bigger purple box, there are two indicators:

Module (shows module information) and Local (shows imported code file info.)

In the diagram above, when you try to read module information, it defaults to Display → Module.

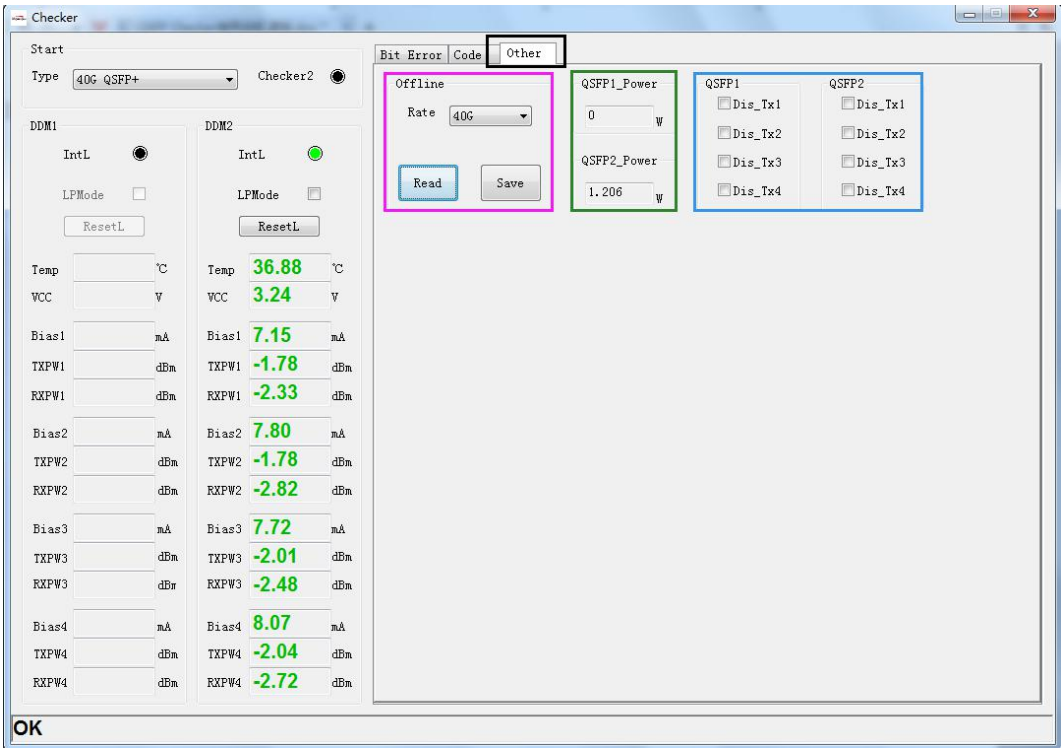
Choose Local if you want to import code file from the local computer to GUI, click Import button, then choose the local code file through the bounced window. After import, it will show directly in Information, then click Write to encode the module.

Export: to export the code file from the module.

A0_0 and A0_2 in Local refer to the page 0 and page 2 of the module A0 register, check details on the protocol. Generally speaking, password is necessary for code reading and writing, default to A0_0 register information; A0_2 is customized by manufacturer, if user wants to read and write, then choose A0_2 in Module (little purple box).

# OtherFunction Page

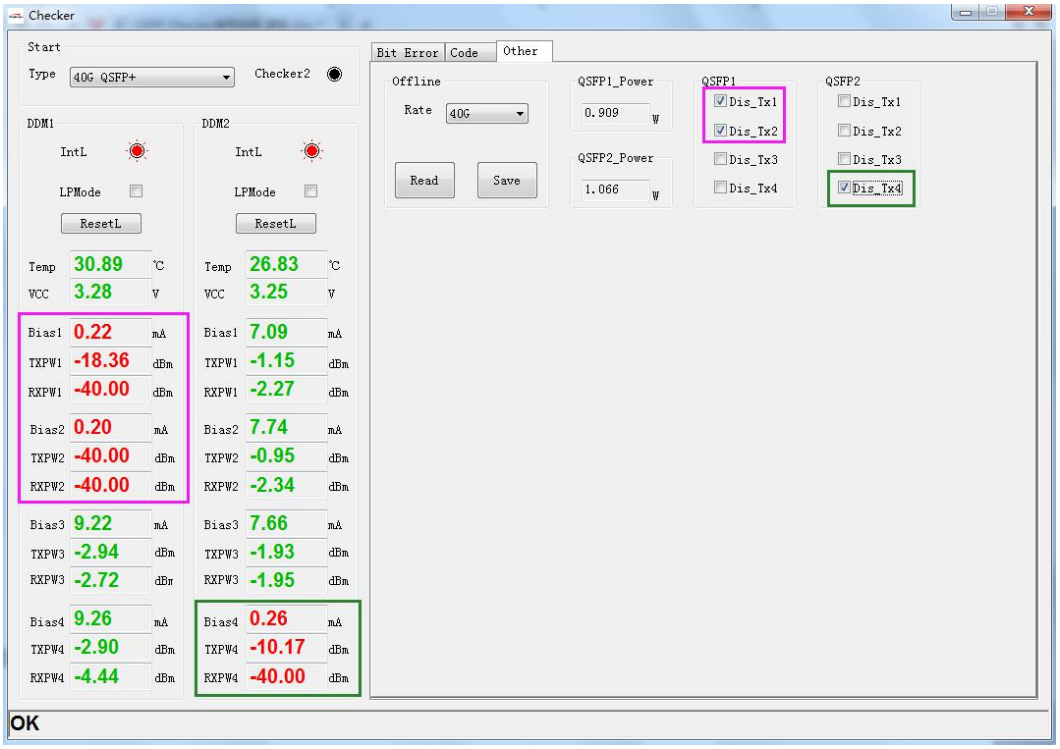
Here to set up offline working rate, power dissipation display, and close Tx end on any channel of the module .




- Type choose 40G QSFP+, wait for initialization completed; click Other in the black box to enter the function page;
- The purple box Offline -- offline mode save (data rate is saved optionally, code type all is code PRBS31);

  The green box -- show power consumption of QSFP1 and QSFP2 (2% - 8% error);

  The blue box -- close Tx end on any channel of the module in QSFP1 or QSFP2.
- Click Offline → Rate, read the mode of offline rate (default rate is 40G);
- Power consumption display: as the module inserted to the port, the value will be automatically showed (generally the value is monitoring value for reference);
- To close Tx end on any channel of the module, tick the box refers to any one of channel or several channels in the corresponding port, the effect as below:




- Choose Dis_Tx of the first and second channel in QSFP1, and the fourth channel in QSFP2;
- In DDM section, Bias1,Bias2 of DDM1, and Bias4 of DDM2 show red alarm.

# Offline Working

The Checker offline working mode is suggested for AOC/DAC test.

1) In GUI you can choose the working rate of offline mode;
2) The other rate mode is set up in GUI after connecting to PC;
3) After choosing different rate mode, please click Save (note: all is code PRBS31);
4) Set up different rate and check other connect mode of optical module, users must strictly follow the guide to operate the product.