# DATASHEET

## TRANSMISOR
## 1550nm Internal Optical Transmitter

# Content

# 1.The product overview

## 1.1 The product overview

Transmisor series 1550nm Direct Modulated Optical Transmitter products adopt the high linearity, optical isolation, the DFB, thermoelectric cooling DFB laser produced by ORTEL 、AOI 、Fujitsu 、Mitsubishi and other world-renowned semiconductor companies. It can provide high-quality images, digital or compressed digital signal long-distance transmission for cable television and telephone communications. Built-in RF driver amplifier and control circuitry to ensure the machine's CNR, CTB, CSO target. Comprehensive and reliable optical circuits and laser output power stability Temperature stability of thermoelectric cooler control circuit to ensure optimal machine performance and long-life laser stability. Laser is the most expensive machine components, machines equipped with microprocessors. The microprocessor software to monitor the working state lasers, operating parameters from the panel LCD display. Once the laser operating parameters deviate from the permissible range set by the software, the microprocessor will automatically turn-off laser power.Flashing yellow light prompts alarm panel LCD prompts cause of the malfunction (non-human factors that can not be damaged laser). RF pre-distortion technology, ensuring the case of CSO-performance system for maximum CNR. In addition, the use of 19 "1U standard rack, built-in high performance switching power supply can be 85 ～ 265Vac City Network voltage work.

## 1.2 The features

1.2.1) High quality: original system optimization control technology and RF pre-distortion technology ensure that the system can acquire the maximum CTB, CSO, and SBS targets in the case of excellent performance CNR

1.2.2)Reliability: The 19"1U standard rack, built-in high-performance dual switching power supply,it can work in the backup at 85 ～ 265Vac City Network Voltage, MS-level automatic switching;chassis cooling automatic temperature control.

1.2.3) Intuitive: The laser is the most expensive machine components, machine equipped with microprocessor monitors the working state of the laser, the panel LCD window displays the operating parameters.Once the laser operating parameters deviate from the permissible range set by the software, micro-processing will automatically turn off laser power, yellow light goes on to warn, the panel LCD prompts the cause of troubles.

1.2.4) Network type: Select All-piece status monitoring transponder guarantee to meet the national standard and be compatible with the SCTE HMS standard, it enable network management monitoring capabilities.

1.2.5) Power plug: Aluminum structure using plug switching power supply, allows for heat dissipation and replacement.And dual power supply hot and cold backup.

## 2. The product structure diagram

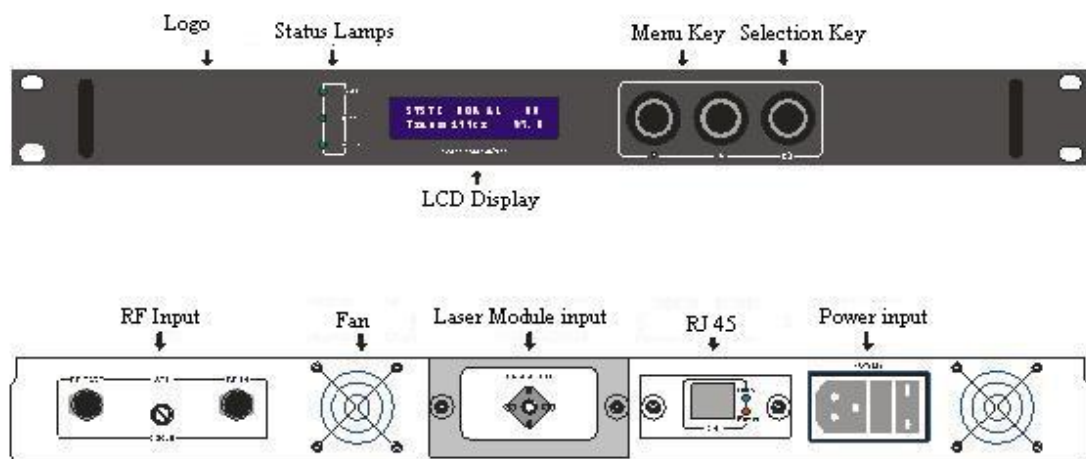### 2.1 The Electrical block diagram
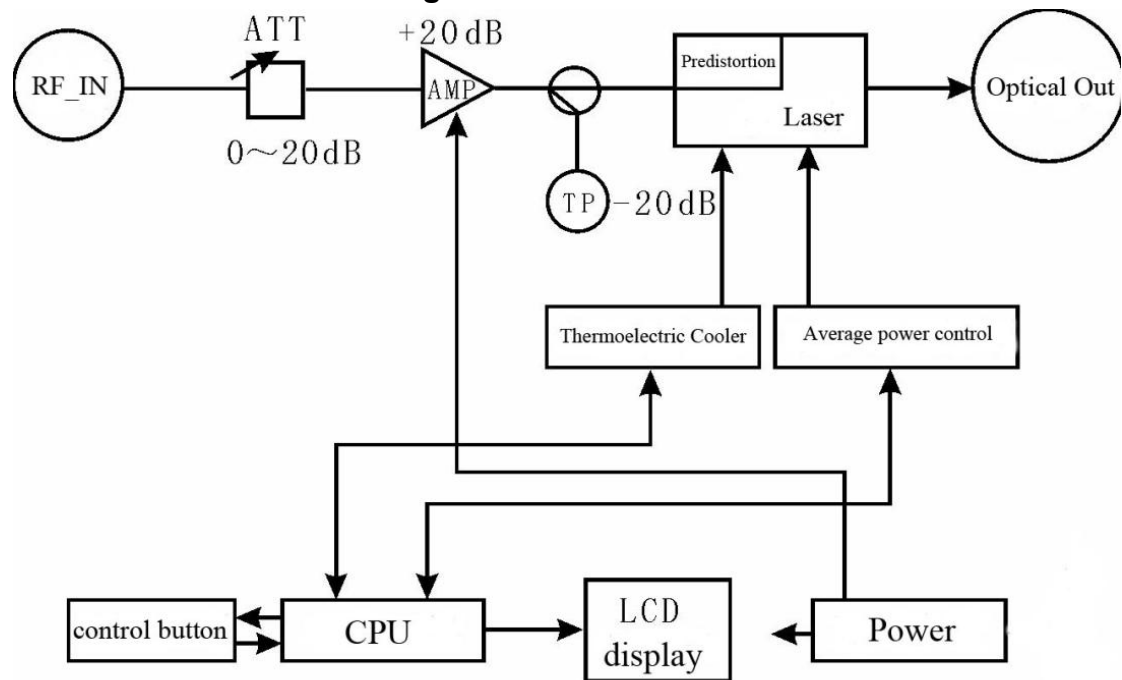


### 2.2 The transmitter's front panel, back panel diagram

# 3 .The main technical indicators

| No. | Item | Units | Parameter | Note |
|---|---|---|---|---|
| 1 | Laser Type | | DFB | See specifications |
| 2 | Wavelength | nm | 1550±10 | |
| 3 | Optical Modulation | | Intensity Modulated | |
| 4 | Optical output power | mW | 2～10 | 10mW |
| 5 | The number of channels | N | 59 | |
| 6 | Optical Connector Type | | FC/APC，SC/APC | Specified before ordering |
| 7 | Frequency range | MHz | 47～750（1G） | |
| 8 | CNR | dB | ≥51.0 | |
| 9 | Flatness | dB | ±0.83 | |
| 10 | RF input level | dBuV | more details in the manual of the chassis cover bar code | |
| 11 | C/CTB | dB | ≥60.0 | |
| 12 | C/CSO | dB | ≥60.0 | |
| 13 | RF input impedance | Ω | 75 | |
| 14 | RF Input Return Loss | dB | ＞16(47～550)MHz<br>14[550～750(862)MHz<br>750(862)MHz | |
| 15 | VCC | V | 90~265Vac | |
| 16 | Power | W | ≤50 | Single-supply operation |
| 17 | Working Temperature | ℃ | 0～50 | Automatic temperature control |
| 18 | Storage temperature | ℃ | -20～85 | |
| 19 | Working relative humidity | % | 20%～85% | |
| 20 | Size | ″ | 19″×15″×1.83″ | (W) x (D) x (H) |
| 21 | Network management interface | | RJ45 | supporting The browser and SNMP |

```
┌─────────────────────────────┐
│ SYS.INITIALIZATION          │
│            WAIT......        │
└─────────────────────────────┘
              ↓
┌─────────────────────────────┐
│ SYS.NORMAL V3.0        0     │
│            HTTP//WWW.        │
└─────────────────────────────┘
              ↓
┌─────────────────────────────┐
│ MODEL                  1     │
│ FWT-1550DS                   │
└─────────────────────────────┘
              ↓
┌─────────────────────────────┐
│ S/N                    2     │
│ X-090910                     │
└─────────────────────────────┘
              ↓
┌─────────────────────────────┐
│ OPTICAL POWER OUT      3     │
│ +20.5mW                      │
└─────────────────────────────┘
              ↓
┌─────────────────────────────┐
│ CASING TEMPERATURE 4         │
│ 30.2℃                        │
└─────────────────────────────┘
              ↓
┌─────────────────────────────┐
│ FAN STATUS             5     │
│ AUTO       Select←→          │
└─────────────────────────────┘
              ↓
┌─────────────────────────────┐
│ RF PARAMETER           6     │  ⇒
│            Select→           │
└─────────────────────────────┘
              ↓
┌─────────────────────────────┐
│ LASER PARAMETER        7     │  ⇒
│            Select→           │
└─────────────────────────────┘
              ↓
┌─────────────────────────────┐
│ POWER PARAMETER        8     │  ⇒
│            Select→           │
└─────────────────────────────┘
              ↓
┌─────────────────────────────┐
│ NETWORK CONFING.       9     │  ⇒
│            Select→           │
└─────────────────────────────┘
```

图（1）

## 4. Operation instruction

4.1 Boot Show: plugging the power connected to AC220V power supply, panel LCD displays "SYS_INITIALIZATTING Wait ... ...", after the System Initialization , the LCD panel displays in Figure (1) as shown in page "0". If the LCD displays the initial screen is always a standstill and only "... ..." In the blink, "TEMP indicator light is red", there are problems in the initial process of the equipment.The general problem is that the temperature offsets the rating too much.

4.2 Product Type: Figure (1) page "01"

4.3 Product serial number: Figure (1) page "02"

4.4 The transmitter wavelength: Figure (1) page "03"

4.5 Operating Voltage +5 V: Figure (1) page "04".

4.6 operating voltage -5 V: Figure (1) page "05".

4.7 Operating Voltage +24 V: Figure (1) page "06".

4.8 Chassis temperature: Figure (1) page "4".

4.9 fan status: Figure (1) page"5". The fan, a total of three kinds of working state can be adopted .In the current page,click the" ○ " key to change the working state, while in the "AUTO" state, when the device internal temperature is higher than 35 ℃ , the SCM will automatically open the chassis fan to cool,and it will not close until the temperature dropped to 30 ℃.

4.10 Laser Temperature: As shown in Figure (1) page "09".lasers work properly at 15 ℃ ∽ 35 ℃ temperature range.LCD displays the actual temperature of laser, such as "25.5 ℃".

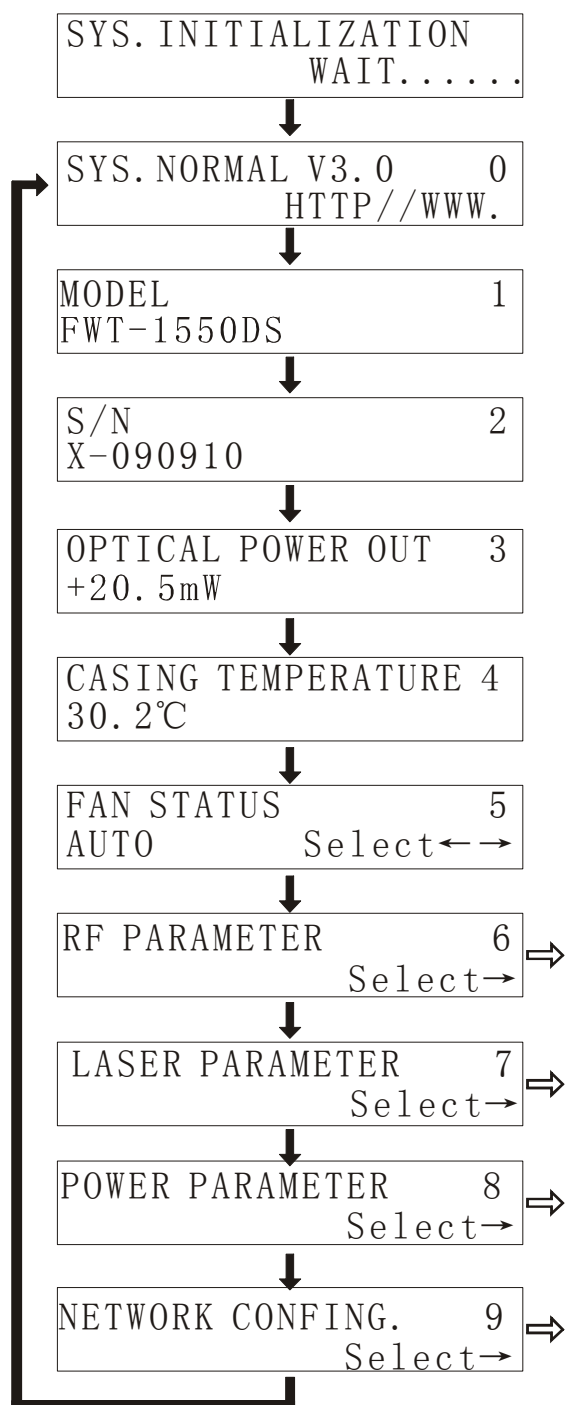4.11 laser cooling current: As shown in Figure (1) page "0A" . In order to ensure the internal temperature of laser range from 20 ℃ ∽ 30 ℃ , we should provide Thermoelectric cooling device a certain amount of operating current.

4.12 laser Bias current: As shown in Figure (1) page "0B" .laser diode has nominal operating current, when the operating current is greater than 130% of rated current, the working life of laser are affected, even damage the lasers. Therefore, when the detected laser operating current is greater than 130% of rated current. The internal hardware circuit of equipment has limited its scope.

4.13 The output power：As shown in Figure (1) page "0C"

4.14 setting IP address: Figure (1) page "0D".

```
┌─────────────────────────────────┐
│        ┌──────────────▼──────┐   │
│        │ IP ADDRESS      D1 │   │
│        │ 192.168.018.012   │   │
│        └──────────▼────────┘   │
│        ┌──────────────────┐   │
│        │ SUBNET ADDRES   D2 │   │
│        │ 255.255.255.000   │   │
│        └──────────▼────────┘   │
│        ┌──────────────────┐   │
│        │ GATEWAY ADDRES  D3 │   │
│        │ 192.168.018.001   │   │
│        └──────────▼────────┘   │
│        ┌──────────────────┐   │
│        │ AGENT_TRAP IP(1) D4│   │
│        │ 192.168.000.144   │   │
│        └──────────▼────────┘   │
│        ┌──────────────────┐   │
│        │ AGENT_TRAP IP(2) D5│   │
│        │ 192.168.000.144   │   │
│        └──────────▼────────┘   │
│        ┌──────────────────┐   │
│ ⇐      │ Return Main Menu D6│   │
│        │           Select← │   │
│        └──────────────────┘   │
└─────────────────────────────────┘
```

4.14.1 setting IP address: Figure (1) page "0D". In the current page click the button " ◯ " to search and configuration net (if you didn't purchase the network transponders, you can skip this step)

In the LAN, this machine should be assigned an IP address and related information. Click " ▼ " to enter "NETWORK CONFING. 0D" and click " ◯ " to enter in Figure (2) The Flowchart shown in pages D1.

4.14.2 setting IP address: Press key "◯" to enter the first one of paragraph 1 of IP address, click " ▲ " the number increases, click " ▼ " number decreases,after the number is selected well ,press " ◯ " key to enter the second setting, and so on. If there is only one paragraph, the front figures are 0.

4.13.3 mask: Click " ▼ " to enter the following sequence flow chart on page A.2, general equipment has been set  "255.255.255.000" in the factory,so adjustment is unnecessary.

4.14.4 Default Gateway: Setting method ibid.

4.14.5 the preferred DNS settings: Setting method ibid.

4.14.6 alternate DNS settings: Setting method ibid.

4.14.7Return to Main Menu: Press " ◯ " to return to the main menu. Press the up and down key to continued to modify the IP.As shown in Fig.2

## 5. Network management applications

HFC network management system, has always been a difficulty that concerned by users and manufacturers.Imported equipment is generally claimed with a network management system which is based on industry standard RS232 or RJ45 interface.In order to achieve the network management, the users need to purchase high-cost private network management software. And each manufacturer's software is not compatible with each other.To achieve network management is very difficult. at present ,there are no news report about available network management in Domestic system. If adopt the SNMP, the users also need to purchase specialized network management software and there are incompatible issues between manufacturers. Many domestic manufacturers also claim that their equipments have a network management system or are compatible with the AM company's network management system.but the device's RJ45 or RS232 interface is basically vacant and can not achieve the network management functions.

Our company is the well-known manufacturers in the cable broadband optical transmission system.we have been concerned about how to use the most economical and most convenient way to achieve the network management in the cable broadband networks. Now the ESV6.0 network management system launched by our company is a new network management concepts based on

the SNMP / TCP / IP protocol .

## 5.1 The interface of integrated work of the monitor server

After pluging the optional transponder ,the machine has the function of network management, just need to connect the RJ45 interface signals to the LAN, and connect to the main server from any of the LAN Ethernet port.,then set up IP addresses, according to the method in 4.A etc. so we can monitor the machine's running conditions real time when the network management system is running



## 5.2 The search interface of the equipment
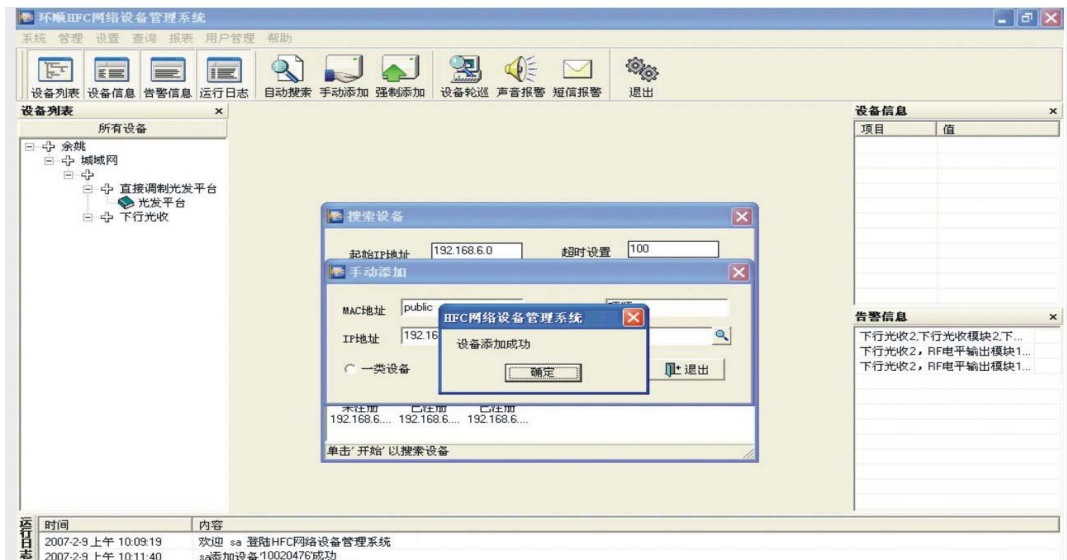


# 6. The notes about optical connection

6.1 attention：

6. .1) before you connect them, carefully clean all the fiber optic connectors and connectors

6.2 Cleaning Guide:

6.2.1　Removal the dust cap of fiber optic connector, pay attention to confirm the optical

connector is a APC surface;

The tips of cleaning fiber optic connector is to use a dedicated and dry cloth without velveteen (the company 5Kimwipes ®'s fine cloth); In addition, preferably adopt special microscope (at 100 times, 200 times) to check the cleanliness of fiber optic connector surface or blemish.

pay attention to maintaining the fiber optic connectors is clean;

6.2.2    cleaning the fiber optic connectors (flange):

you can use a dedicated compressed gas to clean the surface of fiber optic connector;

you can remove the dust which is less than 0.2 microns, better without residue;

hold the tank of compressed air from the connector about 6 inches, alignment flange, and press the nozzle switch shortly times,so you can clean the connector completely;

if there is no dedicated compressed air, the 2.5 mm cotton swab for cleaning can also be used to clean the optical transmitter connectors, or remove the flange and clean the optical fiber jumper connector of the other side directly ;

Note: When handling fiber optic connectors must be very careful to avoid damage.

6.2.3 using the optical fiber jumper to connect the output of optical transmitter to the optical power meter; the connectors of Optical Power Meter must match with each other.

6.2.4    Using the optical power meter to check the output of the transmitter optical power is within normal limits;

# 7. Other notes

7.1 The machine should have a good grounding, grounding resistance should be smaller than 4Ω. According to international standards, 220Vac line adopt three-wire system, the midline is grounding wire.

7.2 The machine should be set up in anti-hot, anti-cold, anti-wet environment, so as to avoid excessive temperature and humidity affect the use life of machine.

7.3 The machine adopts high-performance, highly reliable switching power supply with constant voltage and over-current protection.In the internal of switching power supply ,there is 2A fuse of import that can be work at 85Vac ∽ 265Vac electrical line. The machine using a dual power supply, which can be used for a cold, hot backup, it is recommended to use hot backup.

# 8. The scope of the product warranty

The company's quality assurance system, includes equipment testing and inspection of operational procedures, thus ensure the reliability of product quality. Prior to the product exporting from the Company,we adopt all possible measures to make the electrical, optical, mechanical and other indicators of products have reached the standards promulgated. The Company requires the user to monitor on-site inspection and assembly; the testing personnel should be carry out related operations In strict accordance with the preventive measures formulated when they operate and test optical static sensitive devices.

8.1 Warranty Rules

For users' first-hand products, the company repair them in the area of materials and

manufacturing processes free of charge one year since users pick up them.

Using this product, please follow the requirements on the instructions strictly, do not arbitrarily change. In the warranty period, the user can not break the seal, the internal circuitry can not be changed. If the product does not meet quality requirements or experience problems to be solved, please return the products to the company, the company will handle according to the warranty provisions.

In the warranty period, users have the right to repair or replace the defective product confirmed by the company. However, the above provision is considered invalid to change ownership, or the irregularities caused by use, storage, transport, assembly or accidents.

8.2 assurance for specific product and guide to repair

All products are produced according to high-quality standards to ensure that avoid the failures in technology, materials and external framework, etc. If requests maintenance or return faulty equipment, the user should raise the equipment within 30 days after receipt goods or warranty period, please follow the following principles:

8.2.1 you shall return them after you receipt the Recycling Single issued by the company's sales department. When you apply return, please attach the device model, serial number and return reasons, and requested prepay return shipping. If you do not pay the freight in advance or no recycling single, the Company will not receive.

8.2.2 before the repair, the Company will inform the user about the equipment test results and maintenance costs (generally about the failure caused by the users or issues which do not meet the warranty conditions). If the returned facilities fully meet the quality requirements and don't need to repair, or the user does not require repairs outside of warranty service, users have to pay the basic fee. Only when the user acknowledge all the costs of maintenance, the company carry out repairs. Similarly, only with the user's consent, the company will be able to replace equipment parts (such as connectors), which is very necessary to the company's testing and repair.

8.2.3 the products repaired enjoy the same shelf life, and enjoy warranty treatment within 90 days after pick up the goods.