

# APT Prosper Technology Co.,Ltd

## PRODUCT SPECIFICATION

|              |       |         |
|--------------|-------|---------|
| PART NO.     | 产品型号: | _____   |
| Customer     | 客户名称: | _____   |
| Customer P/N | 客户料号: | _____   |
| Issue Date   | 发布日期: | _____   |
| Version      | 版 本:  | _____   |
| Sign Version | 版本标记: | V4.0 BT |

| Approved 批准 | Check 审核 | Edit 制订 |
|-------------|----------|---------|
|             |          |         |



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| APT Prosper Technology Co.,Ltd                         | Version No.:<br>Issue No.:            |
| 10/100/1000M Intelligent Media Converter Specification | Date of issue:<br>Version tag:V4.0 BT |

## I:Product Summarize.

Fiber media converter be used to transmission Ethernet electric signals into optical signals,the features is transmit and receive optical signals in-pharse by pair of fiber optical cable,due to the signal transmission is light pulse form, so relative to the metal wires are incomparable advantages: high security, reliability, transmission speed, long distance, low cost, saving non-renewable resources. These characteristics are very suitable for metropolitan area networks and local area networking applications.

This series of fiber media covnerter adopted powerful ASIC chip, simple design, high reliability, low power consuming and so on. Alarm function can be remind of the link failure occurs and prompts fault location in time.Use high-quality optical transceiver modules, optical properties provide a good electrical characteristics, to ensure reliable data transmission, long working life.

## II:Produce feature.

- △ According to IEEE802.3z/ab,IEEE802.1q,IEEE802.3u,1000Bast-SX/LX,IEEE802.3ah standard.
- △ Support IEEE802.3X flow control function.
- △ Ethernet port support 10/100/1000M,full-duplex and semiduplex auto-negotiation.
- △ Ultra-low time-delay data transmission, completely transparent to the network protocol.
- △ Port support VLAN,port monitoring.IPV6 port monitoring flux is 4K,base on MAC's Trunking.
- △ Effectiveness of automatic link transfer,dual Tagging/QinQ.
- △ Support for spanning tree and loop detection, IGMP,MLD.
- △ Link failure alarm(LFP)function.
- △ Built-in 128KB RAM data buffer,suport 9728Bytes long data packet.
- △ 50/125um or 62.5/125um multimode fiber link transmission distance up to 2KM.
- △ 9/125um singlemode fiber link transmission distance up to 120KM.
- △ Modulization configuration design ,card can be insert to centralized power supply chassis.
- △ Support 1pcs SFP port, can freely choose the SFP transceiver for singlemode/multimode with different transmission distance.
- △ Support hot-swappable,plug and play.
- △ 6 LED indicators,dynamix feedback link connection state and fault detection.
- △ Easily adjust link failure alarm function open and transmission mode.
- △ Built-in lightning protection circuit, significantly reduce the damage caused by thunderbolt induction.
- △ Average working time more than 100,000hours without failures.

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### III.Basic features:

| Item | Specification/Term         |
|------|----------------------------|
| 1    | Item number                |
| 2    | Standard                   |
| 3    | Flow control               |
| 4    | Transmission speed         |
| 5    | Transmission mode          |
| 6    | Conversion mode            |
| 7    | MAC address                |
| 8    | Buffer space               |
| 9    | Packet length              |
| 10   | Time-delay                 |
| 11   | Bit error rate             |
| 12   | MTBF                       |
| 13   | Power supply               |
| 14   | Power dissipation          |
| 15   | Interface                  |
| 16   | Twisted-pair               |
| 17   | Multimode fiber            |
| 18   | Singlemode fiber           |
| 19   | Wavelength                 |
| 20   | Transmit distance          |
|      | 1) Dualfiber multimode     |
|      | 2) dual fiber singlemode   |
|      | 3) single fiber singlemode |
|      | 4) Cat.5 twisted-pair      |
| 21   | Operating temperature      |
| 22   | Storage temperature        |
| 23   | Humidity                   |
| 24   | Size                       |

### IV.Network standard.

|   |
|---|
| IEEE 802.3 Ethernet (802.3 Ethernet standard)               |
| IEEE 802.3u FastEthernet (Fast Ethernet standard)           |
| IEEE 802.1d Spanning tree (Ethernet spanning tree protocol) |
| IEEE 802.1p Qos (Ethernet Qos standard)                     |
| IEEE 802.3z/ab (Gigabit Ethernet)                           |
| IEEE 802.3ah (OAM function)                                 |

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#### V.Fiber module technical parameter:

##### 1.Dual fiber bi-direction series:

| Item          | Distance | Interface | Fiber type | Wavelength (nm) | Luminous power (dBm) |      | Sensitivity (dBm) | Allowed link loss (dBm) |
|---------------|----------|-----------|------------|-----------------|----------------------|------|-------------------|-------------------------|
|               |          |           |            |                 | MIN                  | MAX  |                   |                         |
| APT-1124M11xC | 550m     | SC        | MM         | 850             | -12.0                | -6.0 | -16.0             | 4.0                     |
| APT-1124S33xC | 20km     | SC        | SM         | 1310            | -8.0                 | -3.0 | -21.0             | 13.0                    |
| APT-1124S34xC | 40km     | SC        | SM         | 1310            | -6.0                 | 0.0  | -24.0             | 18.0                    |
| APT-1124S56xC | 60km     | SC        | SM         | 1550            | -4.0                 | 0.0  | -24.0             | 21.0                    |
| APT-1124S58xC | 80km     | SC        | SM         | 1550            | -2.0                 | 0.0  | -26.0             | 24.0                    |

##### 2.Single fiber bi-direction WDM series:

| Item              | Distance | Interface | Fiber type | Wavelength (nm) | Luminous power (dBm) |     | Sensitivity (dBm) | Allowed link loss (dBm) |
|-------------------|----------|-----------|------------|-----------------|----------------------|-----|-------------------|-------------------------|
|                   |          |           |            |                 | MIN                  | MAX |                   |                         |
| APT-1124WS33/53xC | 20km     | SC        | SM         | 1310/1550       | -6.0                 | 0.0 | -22.0             | 16.0                    |
| APT-1124WS34/54xC | 40km     | SC        | SM         | 1310/1550       | -5.0                 | 0.0 | -24.0             | 19.0                    |
| APT-1124WS36/56xC | 60km     | SC        | SM         | 1310/1550       | -4.0                 | 0.0 | -24.0             | 21.0                    |
| APT-1124WS38/58xC | 80km     | SC        | SM         | 1310/1550       | -3.0                 | 0.0 | -24.0             | 24.0                    |

##### 3.SFP series:

| Item               | Distance | Interface | Fiber type | Wavelength (nm) | Luminous power (dBm) |      | Sensitivity (dBm) | Allowed link loss (dBm) |
|--------------------|----------|-----------|------------|-----------------|----------------------|------|-------------------|-------------------------|
|                    |          |           |            |                 | MIN                  | MAX  |                   |                         |
| APT-1124FL         | -        | SFP       | -          | -               | -                    | -    | -                 | -                       |
| APT-1124FLM11OC    | 550m     | SFP       | MM         | 850             | -12.0                | -6.0 | -16.0             | 4.0                     |
| APT-1124FLS32OC    | 20km     | SFP       | SM         | 1310            | -9.0                 | -3.0 | -22.0             | 16.0                    |
| APT-1124FLS54OC    | 40km     | SFP       | SM         | 1550            | -5.0                 | 0.0  | -30.0             | 30.0                    |
| APT-1124FLS33/53OC | 20km     | SFP       | SM         | 1310/1550       | -6.0                 | 0.0  | -22.0             | 16.0                    |

#### VI:Installation and initialization

Follow these steps to install media converter:

1.Put the patch cord or pigtail from the fiber terminal box to far-end fiber media converter port.

Ps: Dual fiber media converter, please remember TX connect to RX, far-end media converter RX connect to TX.

2. Put the twisted-pair from network equipment to single fiber media converter's LAN port, this media converter

RJ-45 port Auto-negotiation with direct line and cross line. Open the media converter switch(slot chassis type).

3.External power supply media converter connect with DC power adapter, built-in power supply media converter

connect with power cable and please remember open the power switch.

4.After connecting power source, fiber media converter indicator start self-checking, when self-checking

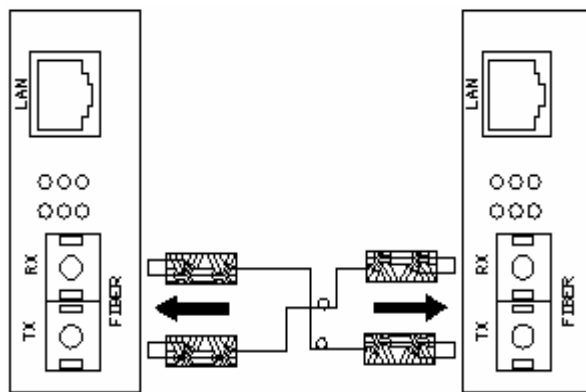
finished, PWR LED will be bright, Other LEDs will be detected under the media converter to the docking with the status of network devices to determine the working status of the media converter.

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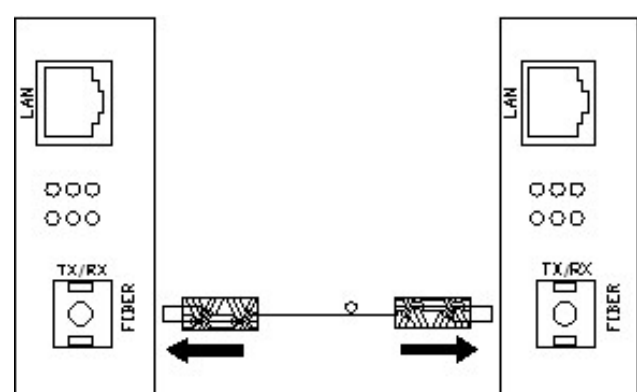
5.Enable the alarm and connection status indicator shows the following table:

| Connection State |       |                  | Turn on link-alarm |                |     |               |                |     | Turn off link-alarm |                |     |               |                |     |
|------------------|-------|------------------|--------------------|----------------|-----|---------------|----------------|-----|---------------------|----------------|-----|---------------|----------------|-----|
| Power            | Fiber | Twisted-pair     | TX1000<br>/ACT     | FXLINK<br>/ACT | FDX | TX100<br>/ACT | TXLINK<br>/ACT | PWR | TX1000<br>/ACT      | FXLINK<br>/ACT | FDX | TX100<br>/ACT | TXLINK<br>/ACT | PWR |
| ON               | OFF   | OFF              | ★                  | ○              | ★   | ★             | ★              | ●   | ○                   | ○              | ○   | ○             | ○              | ●   |
| ON               | OFF   | ON(1000M)        | ★                  | ○              | ★   | ★             | ★              | ●   | ●                   | ○              | ●   | ○             | ●              | ●   |
|                  |       | ON(100M)         | ★                  | ○              | ★   | ★             | ★              | ●   | ○                   | ○              | ●   | ●             | ●              | ●   |
| ON               | ON    | OFF(local side)  | ○                  | ●              | ○   | ○             | ○              | ●   | ○                   | ●              | ○   | ○             | ○              | ●   |
|                  |       | OFF(remote side) | ★                  | ●              | ★   | ★             | ★              | ●   | ○                   | ●              | ○   | ○             | ○              | ●   |
| ON               | ON    | ON(1000M)        | ●                  | ●              | ●   | ○             | ●              | ●   | ●                   | ●              | ●   | ○             | ●              | ●   |
|                  |       | ON(100M)         | ○                  | ●              | ●   | ●             | ●              | ●   | ○                   | ●              | ●   | ●             | ●              | ●   |

PS: ○:Shows light off, ●:Shwos light on, ★:Shows light flash, Twinkling frequency is 100ms.



Map1: Dual fiber media converter connection diagram.



Bside(local side)

Aside(user's side)

Map2: Single fiber media converter connection diagram.

Ps:Single fiber media converter must be use by pair,Side A connect to Side B.To facilitate the management and maintenance,suggest USER's install side B in local side computer center,Side A install in far-end computer center.Manufacture definition side B local side wavelength is TX=1550nm,RX=1310nm;Side A far-end wavelength is TX=1310nm,RX=1550nm.

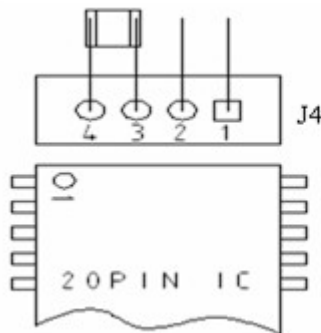
## VII.Link alarm function description.

1.When the media converter link alarm function is enabled, RJ-45 port's link state will notice to the opposite joint device's fiber port.If local side media converter RJ-45 port connection interrupted, local side fiber port will send a busy code to the remote side media converter's fiber port. After remote side media converter received the busy code,it will enforcement the RJ-45 port disconnection. This feature will allow the interconnection between the media converters of each RJ-45 port connection interrupted,opposite joint media converter RJ-45 port will be interrupted at the same time,through the media converter indicator LED(FEF) feedback.

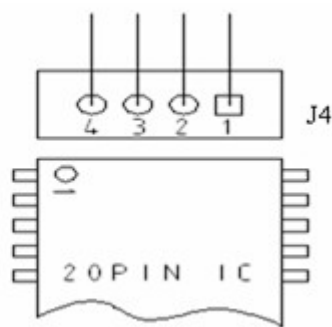
2. Interconnect media converter must be have (link warning) function to achieve link alarm functions.

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3. Link alarm function can be set by short patch cord through the Board .The patch cord should be located in the side of Board's 20PIN IC.



Turn-on link alarm function.



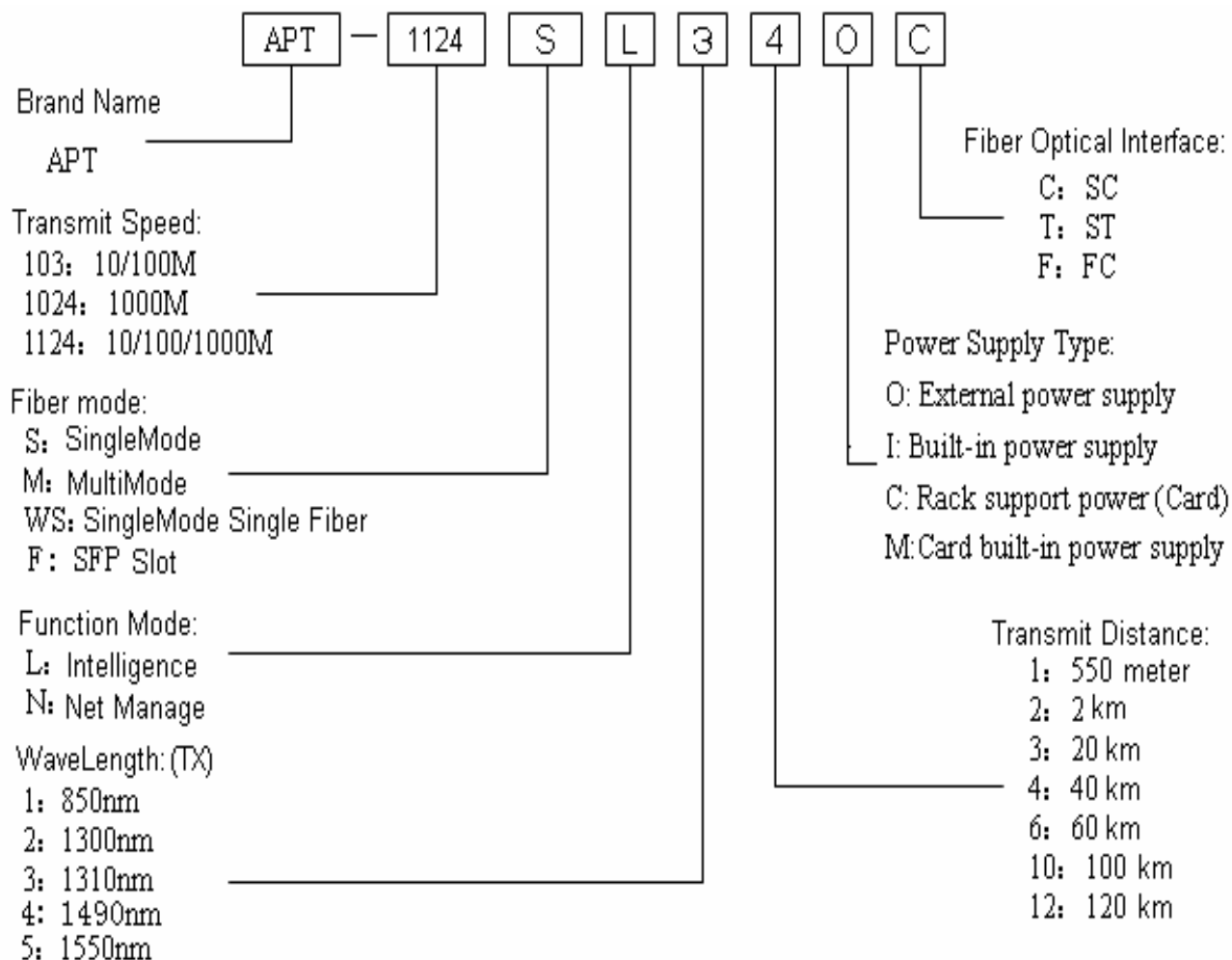
Turn-off link alarm function.

#### VIII.LED indicator definition.

| LED indicator | Color | Signification   |
|---------------|-------|---|
| TX1000        | Green | light: fiber interface working speed is 1000M bps<br>off: fiber interface working speed is <1000M bps                             |
| FX-Link/Act   | Green | light:Fiber link connected correctly.<br>flash:fiber link have data transmission.<br>off:fiber link connected faulty.             |
| FDX           | Green | Light:Twisted-pair work in full-duplex.<br>Off:Twisted-pair work in semiduplex..  |
| TX100         | Green | Light:twisted-pair working speed is 100M..<br>Off:twisted-pair working speed is 10M..   |
| TX-Link/Act   | Green | Light :twisted-pair connected correctly.<br>Flash:twisted-pair have data transmission.<br>Off:twisted-pair link connected faulty. |
| PWR           | Green | Light:Power connected.<br>Off:power unconnected or power adapter damaged.   |

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**IX.Product classify and naming rule:**

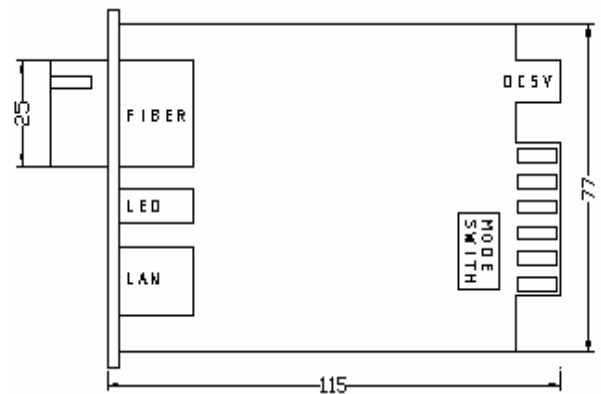
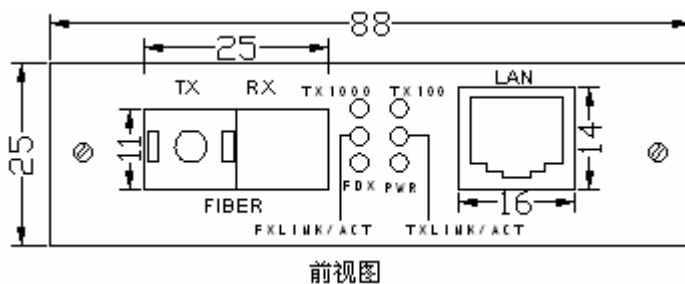


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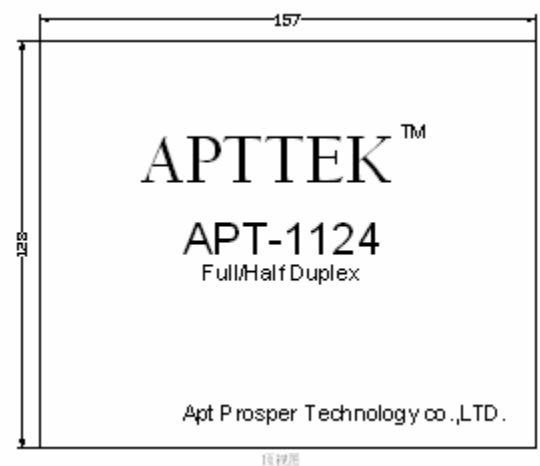
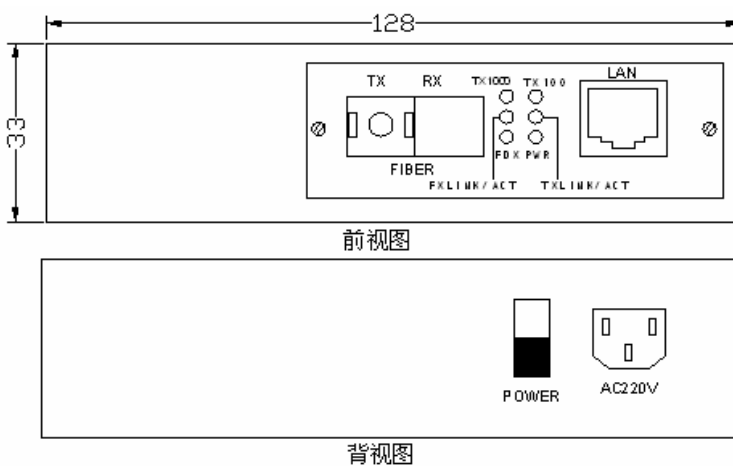
#### X.Product figuration and size:

| Item           | Shell Type      | Size (L*W*H mm) | Power supply | Weight | Remark                        |
|----------------|-----------------|-----------------|--------------|--------|-------------------------------|
| APT-1124xLxxCx | Card            | 115 * 77 * 26mm | Centralized  | 0.26kg | Install in 19"16-slots chassi |
| APT-1124xLxxMx | Slot-chassis    | 158*128*32mm    | Built-in     | 0.75kg |                               |
| APT-1124xLxxOx | Independent     | 118 * 87 * 28mm | External     | 0.48kg |                               |
| APT-1124FL     | SFP card        | 115 * 77 * 26mm | centralized  | 0.26kg | Install in 19"16-slots chassi |
| APT-1124FL     | SFP independent | 118 * 87 * 28mm | External     | 0.48kg |                               |

#### 1.Card media converter figuration size item view:

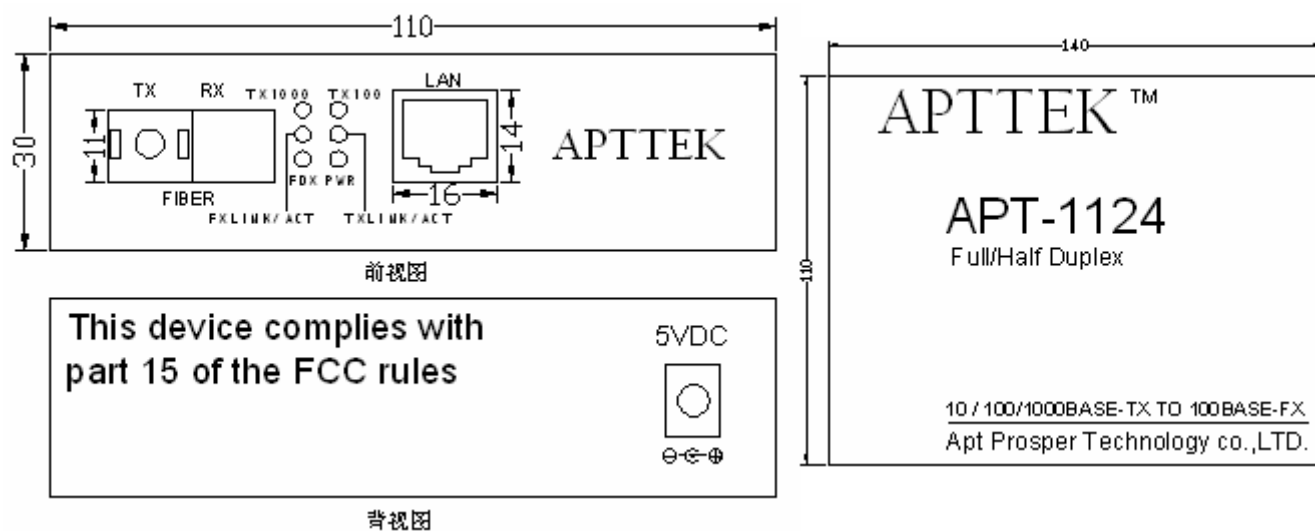


#### 2. Slot chassis media converter figuration size item view:

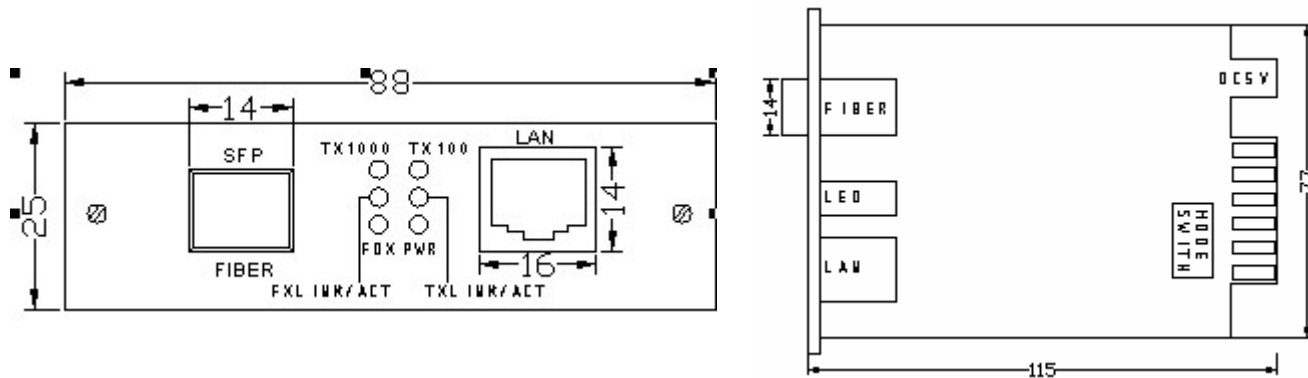


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### 3.Independent media converter figurature size item view:



### 4.SFP card media converter figurature size item view:



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## XI.Fault treatment

1.Simple faulty check: If the media converters can't work in normal,in the state of not enable link-alarm function,please refer the media converter LED do the simple faulty check.

| Faulure phenomenon  | Causes   | Check  | Solution  |
|---------------------|--|--|---|
| POW LED off         | 1.Power adapter damaged<br>2.Power source unconnected.   | 1.Power port have voltage or not.<br>2.Power source switch on or not.  | 1.If don't have voltage,please repair power adapter.<br>2.Open power source switch.   |
| TX-Link/Act LED off | 1.LAN port twisted-pair unconnected.<br>2.Twisted-pair splice mistake.<br>3.Speed unmatched with twisted-pair.<br>4.Connected network equipment work in abnormal.      | 1.Twisted-pair connected reliable or not.<br>2.Twisted-pair line SEQ correct or not.<br>3.Media converter speed setup.<br>4.Connected network equipment open or not. | 1.Connected twisted-pair again.<br>2.Renew twisted-pair crystal head.<br>3.Adjust the speed rate of media converter's RJ-45 port.<br>4.Open the network equipment which connect to the media converter. |
| FX-Link/Act LED off | 1.Fiber unconnected.<br>2.Fiber type unmatched.<br>3.Fiber section too dirty.<br>4.Dual fiber TX/RX splice mistake.<br>5.Fiber link interrupt or abnormal attenuation. | 1.Fiber link reliable or not.<br>2.Fiber type.<br>3.Fiber section.<br>4.Fiber port TX/RX connecting.<br>5.Fiber damaged or serious distortion.                       | 1.Link the fiber again.<br>2.Replace convenient fiber.<br>3.Clean or replace fiber cable.<br>4.Remote side TX connect to local side RX,RX to TX.<br>5.Replace fiber cable.                              |

PS: If media converter has turned link-alarm function,each fiber link or network link interrupt,other side network link should be interrupt,and showed with flashing warn by LED indicator(FDF). Interconnect media converter must be have (link warning) function to achieve link alarm functions.

Star using link alarm function,system state and fault phenomena as following table:

| Start Using Link Alarm Function |             |     |       |             |     | Status                       |
|---------------------------------|-------------|-----|-------|-------------|-----|------------------------------|
| TX1000                          | FXLINK /ACT | FDX | TX100 | TXLINK /ACT | PWR |                              |
| ○                               | ●           | ●   | ●     | ●           | ●   | Link ok,RJ-45 speed is 100M. |
| ●                               | ●           | ●   | ○     | ●           | ●   | Link ok,RJ-45 speed is 1000M |
| ○                               | ●           | ○   | ○     | ○           | ●   | Local side RJ-45 interrupt.  |
| ★                               | ●           | ★   | ★     | ★           | ●   | Remote side RJ-45 interrupt. |
| ★                               | ○           | ★   | ★     | ★           | ●   | Fiber port interrupt.        |

PS: ○:Shows light off, ●:Shwos light on, ★:Shows light flash, Twinkling frequency is 100ms.

## 2.Others faulty check

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**A. Network packet loss by strictness,maybe have such fault:**

- (1) Media converter RJ-45 port and network equipment RJ-45 port unmatched or both side equipments full-duplex mode unmatched.
- (2) Something the matter of Twisted-pair and RJ-45 port,check it become flexible or oxidation.
- (3) Something the matter of fiber link,patch cord match with the equipments or not,pigtail or patch cord and coupler matching or not.

**B. Could not communicate after fiber media converter connected.**

- (1) Fiber cable TX and RX port connecting wrong,swap back TX and RX interface.
- (2) RJ45 port and interconnected equipment connecting wrong,(direct-through wire or crosswire) ,fiber interface unmatched. (ceramic ferrule)

**C. Phenomena of sometimes connected and interrupted.**

- (1) Maybe the fiber link attenuation too large,please test the luminous power of receive side by Optical Power Meter.If the line lose value higher than 2db of theoretical, basic fault can be judged as optical.
- (2) Maybe the interconnected switch failure,try to connect with PC,means 2pcs media converters connect with PC by directly,if working normal,basic fault can be judged as switch.
- (3) Maybe media converter failure,connect with the media converters to PC by directly,both ends PING have not problems then try to transmit a 100M big file,be observed the speed,if the speed too slowly(Less than 200M doc transmit time more than 15 minutes),basic falt can be judged as mdia converter.

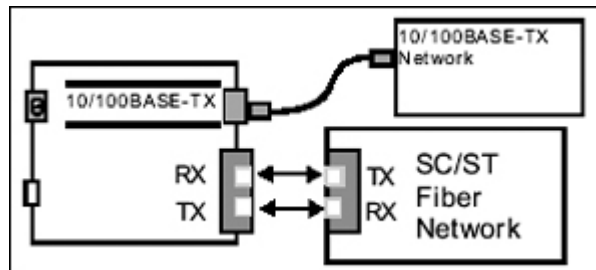
**D. Communications for some times,media converter stop working,but restart it will working in normal.**Due to such phenomenon be arose by switch, Switch can be test for all the received data CRC error detection and length check,check out the errors of the package will be discarded, the correct package will be forwarded out,in this process some errors in the package and the length of the CRC checksum error detection can not be detected in all, this package will not be in the forwarding process of sent and will not be discarded, they will accumulate in the dynamic cache (buffer), the never sent, wait until the buffer in the heap is full, will result in the phenomenon of switch stop working.Because then restart or reboot the switch or media converter can enable communication back to normal, so users often considered that is media converter's problem.

**E.Media converter test method:If found media converter have link problem,please use following method try to test,convenient to find out failure causes.**

- a) Local side test:Both end PC PING,if PING connecting that means media converter without problems,if local side can't communication,can be judged media converter failure.
- b) Remote side test:Both end PC PING,if PING unconnecting shows need check fiber link normally or not and media converter's transmit/receive power are in permitted range or not.If PING connecting shows fiber link normally.Can be judged switch failure.
- c) Remote side test judged the failure:Link to switch for one side,both side PING connecting,if no failure can be judged the other switch failure.

**F. Use PC PING program to check the media converter on/off method.**

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Equipment requirements:

2pcs PC,2pcs UTP twisted-pair,1pcs fiber patch cord,2pcs media converter,2pcs netcard.

#### Hardware connection:

##### a. UTP twisted-pair connection(link to netcard and media converter)

Put UTP twisted-pair in PC's netcard port and media converter's RJ-45 port.

##### b. Fiber patch cord connection(link to 2pcs media converters)

Put multimode dual fiber patch cord(orange color)(single fiber media converter use single fiber patch cord)in media converter's fiber port,RX link to TX.

##### c. Put the power adapter in DC faucet.

In Windows98/2000 environment:

##### 1. Setup TCP/IP protocol for your PC.

1). Start-> Setup-> Control panel

2). Bbldclick Network and dial-up connection icon -> Click local area coonection-> Click right-click then pop-up short cut menu,click attribute

3). In the pop-up local area atttribute dialog box,selected bound on the netcard's TCP/IP protocol.

4). Click attribute,setup netcard IP address. In the pop-up Internet protocol(TCP/IP)attribute dialog box selected:Use the following IP address bar,fill in 192.168.0.1 in IP address column,fill in subnet mask 255.255.255.0,then click confirm finished TCP/IP protocol setup.

5). Use the same way setup the second PC TCP/IP address. Pay attention on it,the second PC IP address can't as same as the first PC,you can fill in IP address 192.168.0.2.

##### d. Use Ping order check PC and media converter interconnection state in Windows2000,click start on the first PC,in the pop-up menu click Running,input PING order in the pop-up menu.

```
ping 192.168.0.2 -t -l 3200
```

If the screen shows:

```
ping 192.168.0.2 with 3200 bytes of data:
```

```
Reply from 192.168.0.2:bytes=3200 time<10ms TTL=128
```

```
Reply from 192.168.0.2:bytes=3200 time<10ms TTL=128
```

```
Reply from 192.168.0.2:bytes=3200 time<10ms TTL=128
```

```
Reply from 192.168.0.2:bytes=3200 time<10ms TTL=128
```

Ping statistics for 192.168.0.2:

Packets:Sent=4, Receive=4 ,Lost=0 (0 % loss)

Congratulation,your PC has succeed link with the media converter.

If screen shows:

```
ping 192.168.0.2 with 3200 bytes of data:
```

```
Request timed out
```

```
Request timed out
```

|  |   |
|--|---|
| APT Prosper Technology Co.,Ltd                         | Version No.:<br>Issue No.:<br>Date of issue:<br>Version tag:V4.0 BT |
| 10/100/1000M Intelligent Media Converter Specification |   |

Request timed out

Request timed out

Ping statistics for 192.168.0.2:

Pakets:Sent=4, Receive=0 ,Lost=0 (100 % loss)

It shows devices not installed well.Please check by following SEQ:

1).Hardware link correct or not?

Remind:Media converter LED indicator and netcard LED indicator must be bright.

2).Your PC's TCP/IP setup correct or not ?

Remind:If the first PC IP address is 192.168.0.1,so the second PC IP address must be 192.168.0.XXX(XXX range 2~254),subnet mask must be:255.255.255.0

## **XII:Matters need attention.**

1. Avoid direct vision the media converter's TX when it works.
2. Please put dust cover when the media converters are not in use.
3. To make the alarm function of this product with maximum effect,matching connection media converter must be have link alarm function.
4. Keep in ventilation for the products.Avoid direct sunlight and rain and lightning.Remember keep good electrostatic protection.