I/O Modules Overview

Use these instructions to set up the I/O modules supported in your TippingPoint security devices.

Before You Begin

• Review the release notes for your product for any late-breaking changes to the installation instructions.
• Read and follow all safety information listed in documentation that shipped with your product.
• Complete the installation of your TippingPoint security device.

ESD Requirements

Damage from Electromagnetic Static Discharge (ESD) can occur when electronic components are improperly handled. Improper handling can result in complete or intermittent system failures. Proper ESD protection is required whenever you handle equipment. The following general grounding guidelines apply:

• Always use an ESD wrist strap when adding or removing components from the chassis.
• Avoid touching the circuit boards or connectors on all cards and modules.
• Avoid contact between the printed circuit boards and clothing. The wrist strap only protects components from ESD voltages on the body. ESD voltages on clothing can still cause damage.

Place a removed component board-side-up on an antistatic surface or in a static-shielding container that is also grounded to the same point as the device. If you plan to return the component to the factory, immediately place it in a static-shielding container.

I/O Module Options

TippingPoint devices with module slots support both standard I/O modules and bypass I/O modules (refer to the following table) for fiber and copper components.

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Important: Only optical transceiver modules (including SFP, SFP+, and QSFP+) available from TippingPoint have been validated to achieve optimal performance with TippingPoint products. Other vendor devices are not supported and could be detrimental to proper operation of the TippingPoint system.

Bypass I/O modules are zero-power high-availability (ZPHA) modules that permit network traffic and services while bypassing the device entirely when the device loses power. All four standard I/O...
modules and all five bypass I/O modules are hot-swappable on devices running TippingPoint Operating System (TOS) v3.6.0 or higher.

For more information on I/O modules, refer to the product hardware documentation for your device.

**Standard I/O Modules**

6-Segment Gig-T

- Ports: 12 Fixed RJ-45 copper ports
- Port speed: 10/100/1000 Mbps
- Part number: TPNN0059

6-Segment GbE SFP

- Ports: 12 SFP ports
- Port speed: 1 Gbps
- Part number: TPNN0068

4-Segment 10GbE SFP+

- Ports: 8 Fiber SFP+ ports
- Port speed: 10 Gbps
- Part number: TPNN0060

1-Segment 40 GbE QSFP+

- Ports: 2 Fiber QSFP+ ports
- Port speed: 40 Gbps
- Part number: TPNN0069

**Bypass I/O Modules**

4-Segment Gig-T Bypass Module

- Ports: 8 copper ports
- Port speed: 10/100/1000 Mbps
- Part number: TPNN0070

2-Segment 1G Fiber SR/LR Bypass Module

- Ports: 4 Multi-Mode (SR)/Single-Mode (LR) Fiber (LC type)
- Port speed: 1 Gbps
- Part number: TPNN0071/TPNN0072

2-Segment 10G Fiber SR/LR Bypass Module

- Ports: 4 Multi-Mode (SR)/Single-Mode (LR) Fiber (LC type)
- Port speed: 1/10 Gbps
- Part number: TPNN0073/TPNN0074
**Important:** Handle all I/O modules with care. The bypass modules contain mechanical switches that are very delicate and can cause network disruption if handled improperly. For more information about deploying bypass modules, refer to the product hardware documentation for your TippingPoint security device.

**Add I/O Modules**

TippingPoint devices come with blank modules inserted into module slots.

To remove the blank module, slide the slide latch (1) to the right and pull on the handle (2 on left module) or grab point (2 on right module).

**CAUTION:** Never lift your device using the module handles.

To insert an I/O module, slide the module into the empty module slot. When the module is in the correct position, the slide latch automatically slides into position.

**Warning:** Do not leave slots empty for an extended period of time. Insertion of a blank module or I/O module ensures that the device is correctly cooled.

**Module LEDs**

The following table describes the module LEDs.

<table>
<thead>
<tr>
<th>Feature</th>
<th>LED</th>
<th>Color</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fixed RJ45 copper port</td>
<td>Link</td>
<td>Green</td>
<td>Link is active.</td>
</tr>
<tr>
<td></td>
<td>Activity</td>
<td>Blinking amber</td>
<td>Data traffic passing.</td>
</tr>
<tr>
<td>Optical transceiver port</td>
<td>Link</td>
<td>Green</td>
<td>Link is active.</td>
</tr>
<tr>
<td></td>
<td>Activity</td>
<td>Amber</td>
<td>Data traffic passing.</td>
</tr>
</tbody>
</table>
Hot-Swapping I/O Modules

On devices running TOS v3.6.0 or higher, I/O modules can be installed or removed while the device is in the normal operating state. *Hot-swapping I/O modules during system initialization is not supported.* There are several slot and port configuration factors to consider when hot-swapping I/O modules. For detailed guidelines and procedures, refer to the product hardware documentation for your TippingPoint security device.

**Supported Transceivers and Cables for TippingPoint I/O Modules**

<table>
<thead>
<tr>
<th>I/O module &amp; part number</th>
<th>Transceiver part number</th>
<th>Transceiver name</th>
</tr>
</thead>
<tbody>
<tr>
<td>6-Segment GbE SFP (TPNN0068)</td>
<td>TPNN0054</td>
<td>TippingPoint X126 1G SFP RJ45 Transceivers (Copper and Fiber)</td>
</tr>
<tr>
<td>4-Segment 10GbE SFP+ (TPNN0060)</td>
<td>TPNN0057</td>
<td>TippingPoint S136 10G SFP+ LC SR Transceiver</td>
</tr>
<tr>
<td></td>
<td>TPNN0058</td>
<td>TippingPoint S136 10G SFP+ LC LR Transceiver</td>
</tr>
<tr>
<td></td>
<td>TPNN0054</td>
<td>TippingPoint X126 1G SFP RJ45 Transceivers (Copper and Fiber)</td>
</tr>
<tr>
<td>1-Segment 40 GbE QSFP+ (TPNN0069)</td>
<td>TPNN0067</td>
<td>TippingPoint S146 40G QSFP+ SR4 850nm Transceiver</td>
</tr>
<tr>
<td></td>
<td>TPNN0327</td>
<td>TippingPoint S146 40G QSFP+ LR4 1310nm Transceiver</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>I/O module part number</th>
<th>Cable part number</th>
<th>Cable name</th>
</tr>
</thead>
<tbody>
<tr>
<td>TPNN0069*</td>
<td>TPNN0212</td>
<td>TippingPoint 40G QSFP+ Active Optical Cable (AOC)</td>
</tr>
</tbody>
</table>

*When this I/O module is used with this cable, transceivers TPNN0067/TPNN0327 are not needed. The cable has the transceiver attached.*
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