

# SM8TAT2DPB

## Managed Switch, 8-port Gigabit PoE+, 2-port SFP/RJ-45 Combo



# **Install Guide**

33698 Rev. A

## **Safety Warnings and Cautions**

These products are not intended for use in life support products where failure of a product could reasonably be expected to result in death or personal injury. Anyone using this product in such an application without express written consent of an officer of Transition Networks does so at their own risk, and agrees to fully indemnify Transition Networks for any damages that may result from such use or sale.



**NOTE:** Emphasizes important information or calls your attention to related features or instructions.



WARNING: Alerts you to a potential hazard that could cause personal injury.

**CAUTION:** Alerts you to a potential hazard that could cause loss of data, or damage the system or equipment.

### SM8TAT2DPB Install Guide - TN PN 33698 Rev. A

#### **Record of Revisions**

Rev	Date	Description of Changes
А	11/14/16	Initial release for software v6.48.

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## **Compliance and Safety Statements**

**FCC-CLASS A**: This equipment has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment.

This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

You are cautioned that changes or modifications not expressly approved by the party responsible for compliance could void your authority to operate the equipment.

You may use unshielded twisted-pair (UTP) for RJ-45 connections - Category 3 or better for 10 Mbps connections, Category 5 or better for 100 Mbps connections, Category 5, 5e, or 6 for 1000 Mbps connections. For fiber optic connections, you may use 50/125 or 62.5/125 micron multimode fiber or 9/125 micron single-mode fiber.

**CE MARK DECLARATION OF CONFORMANCE FOR EMI AND SAFETY (EEC)**: This equipment has been tested and found to comply with the protection requirements of European Emission Standard EN55022/EN61000-3 and the Generic European Immunity Standard EN55024.

#### Declaration of Conformity



#### **Related Manuals**

The following manuals give specific information on how to use the switch:

- SM8TAT2DPB Quick Start Guide, 33697
- SM8TAT2DPB Install Guide, 33698
- SM8TAT2DPB Web User Guide, 33699
- SM8TAT2DPB CLI Reference, 33700

To access the manuals, firmware, datasheet or other documentation for your product, enter your model number (SM8TAT2DPB) in the "Search" box at our website at <u>https://www.transition.com</u>.

For Transition Networks Drivers, Firmware, Manual, etc. go to the <u>Product Support</u> webpage (no logon required). For Transition Networks Application Notes, Brochures, Data Sheets, Specifications, etc. go to the <u>Support Library</u> (no registration required).

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## 1. Introduction

### Overview

The Transition Networks SM8TAT2DPB L2+ Managed PoE+ Switch provides high-performance, IEEE-compliant network solutions. They include powerful management features that can boost performance and increase productivity. This guide describes hardware installation and basic troubleshooting for these managed switches.

### Front Panel

The SM8TAT2DPB switch front panel has system and port LEDs for installation and troubleshooting and the **Mode/Reset** button.

System LED Link / Act / Speed LED Mode LEDs Mode/Reset button Console Port 10/100/1000 RJ45 Ports 100/1000 RJ45/SFP Combo Ports Combo Ports Port Port Status LEDs

The SM8TAT2DPB front panel is shown and described below.

### LED Descriptions

The LEDs on the front panel provide users with switch status checking and monitoring. The three types of LEDs are System, Mode, and Port Status. The following section details the functions and descriptions of the LED indicators.

### System LED

The System LED indicates if the switch is powered up correctly or not, or, indicates if there is a system alarm triggered for troubleshooting.

LED	Color	State	Description
	Green	On	The switch is powered ON correctly.
		Off	The switch is not receiving power.
System	Red	On	An abnormal state, such as exceeding operating temperature range, has been detected in the switch.

#### Mode LEDs

The Mode LEDs indicate the mode of all RJ45/SFP ports on the switch. Users can press the **Mode/Reset** button sequentially to switch between the two different modes (Link/Activity/Speed mode and PoE mode).

LED	Color	State	Description
Link/Act/Speed	Green	On	The Port Status LEDs are displaying link status, network activity and speed of each port.
PoE	Green	On	The RJ45 Port Status LEDs are displaying PoE powering status of each port.

Press and hold the **Mode/Reset** button for less than 2 seconds to change LED modes (Link/Act/Speed Mode or PoE Mode); you can check the port status by reading the LED behaviors per the table below.

#### Port Status LEDs

indicates the current status of each RJ45/SFP port. You can check these LEDs to understand the port status in different modes, after changing the mode by pressing the **Mode/Reset** button.

Wher	When Link/Act/Speed Mode LED Lit				
LED Color State Description		Description			
	Green	On	The port is enabled and established a link to connected device, and the connection speed is 1000Mbps.		
	Green	Blinking	The port is transmitting/receiving packets, and the connection speed is 1000Mbps.		
RJ45	Amber	On	The port is enabled and established a link to connected device, and the connection speed is 10/100Mbps.		
Ports	Amber	Blinking	The port is transmitting/receiving packets, and the connection speed is 10/100Mbps.		
		Off	The port has no active network cable connected, or it is not established a link to connected device. Otherwise, the port may have been disabled through the switch user interface.		
	Green	On	The port is enabled and established a link to connected device, and the connection speed is 1000Mbps.		
SFP	Green	Blinking	The port is transmitting/receiving packets, and the connection speed is 1000Mbps.		
Ports	Amber	On	The port is enabled and established a link to connected device, and the connection speed is 100Mbps.		
	Amber	Blinking	The port is transmitting/receiving packets, and the connection speed is 100Mbps.		

Off established a link to connected dev		Off	The port has no active network cable connected, or it is not established a link to connected device. Otherwise, the port may have been disabled through the switch user interface.		
When PoE Mode LED Lit					
LED	Color	State	Description		
	Green	On	The port is enabled and supplying power to connected device.		
DIAE	Amber	On	An abnormal state, such as overload status, has been detected		

RJ45		in the switch.
Ports	 Off	The port has no active network cable connected, or it is not connected a PoE PD device. Otherwise, the port may have been disabled through the switch user interface.

### Mode/Reset button

Press the **Mode/Reset** button for a specific period of time to perform these tasks:

- Change Port Status LED Mode: to read the port status correctly in the two different modes (Link/Act/Speed mode or PoE mode).
- **Reset the Switch**: to reboot and get the switch back to the previous configuration settings saved.
- Restore the Switch to Factory Defaults: to restore the original factory default settings back to the switch.

**Note**: The table below describes the task being performed by reading the LED behaviors while pressing the Mode/Reset button. Once the LED behaviors are correctly displayed, you may release the button.



Task to Perform	Press the Button for	SYS LED Behavior	Port Status LED Behavior
Change LED Mode	0 ~ 2 seconds		LED status will be changed according the mode selected.
Reset the Switch	2 ~ 7 seconds	Blinking Green	All LEDs Light OFF
Restore to Defaults	7 ~ 12 seconds	Blinking Green	All LEDs Stay ON

## **Back Panel**

The SM8TAT2DPB back panel is shown below.





**NOTE:** For a detailed description of the management features, refer to the full *Web User Guide*.

## 2. Installation

**CAUTION:** Circuit devices are sensitive to static electricity, which can damage their delicate electronics. Dry weather conditions or walking across a carpeted floor may cause you to acquire a static electrical charge. To protect your device, always:

- Touch the metal chassis of your computer to ground the static electrical charge before you pick up the circuit device.
- Pick up the device by holding it on the left and right edges only.
- If you need to connect an outdoor device to this device with cable then you must add an arrester on the cable between outdoor device and this device.



Fig. Add an arrester between outdoor device and this switch

**NOTE:** The switch is an indoor device; if it will be used in an outdoor environment or connects with some outdoor device, then it must use a lightning arrester to protect the switch.

## WARNING:

- Self-demolition on Product is strictly prohibited. Damage caused by self-demolition will be charged for repairing fees.
- Do not place product at outdoor or sandstorm.
- Before installation, please make sure input power supply and product specifications are compatible to each other.
- To reduce the risk of electric shock, disconnect all AC or DC power cords to completely remove power from the unit.
- Before importing / exporting configuration please make sure the firmware version is always the same.
- After firmware upgrade, switch automatically moves configuration to latest firmware version.

**Warning**: this case must be grounded. No DC input may be grounded. The SM8TAT2DPB is compliant with 802.3at in Environment A when using an isolated power supply. For 802.3at Environment B applications, use mid-span injector (s), e.g. MIL-L100i, L1000i-at, between this switch's PSE port and link partner PD port.

## Package Contents

Verify that you received these iterms.

- SM8TAT2DPB GbE Management Switch
- Four adhesive rubber feet
- Mounting Accessory (for 19" Rack Shelf, Optional)
- Quick Start Guide
- AC Power cord
- Console cable

Save the packaging for possible future use.



### Mounting the Switch in a 19-inch Rack

**Step1.** Attach the mounting brackets to both sides of the chassis with screws.

Figure 4 Attaching mounting brackets to the switch



- **Step2.** Place the switch on a rack shelf in the rack. Push the switch in until the oval holes in the brackets align with the mounting holes in the rack posts.
- **Step3.** Attach the mounting brackets to the rack posts with screws.

#### Figure 5 Attaching mounting brackets to the rack post



## Mounting the Switch on a Desk or Shelf

- **Step1.** Verify that the workbench is sturdy and reliably grounded.
- **Step2.** The rubber feet are included in the accessory kit. Attach the four adhesive rubber feet to the bottom of the switch.

#### Figure 6 Attaching the Rubber Feet



### **Connecting the AC Power Cord**

#### Figure 7 Connecting the AC power cord to the AC power receptacle



- **Step1.** Connect one end of the AC power cord to the AC power receptacle on the switch.
- Step2. Connect the other end of the AC power cord to the AC power outlet.
- **Step3.** Examine the power LED. If it is ON, the power connection is correct.

## **Installing SFP Modules**

You can install or remove a mini-GBIC SFP from a mini-GBIC slot without having to power off the switch. See the Transition Networks <u>SFP webpage</u> for more information on our line of Optical Devices. See the specific SFP manual for information specificto your SFP module (cautions and warnings, compliance, installing, fiber cable characteristics, connecting fiber cables, removing an SFP module, DMI / DDMI data, etc.

**Step1.** Insert the SFP module into the switch port.

Step2. Press firmly to ensure that the module seats into the connector.

#### Figure 8 Installing a SFP Module into a SFP Module Slot



### **Connecting the Console Port**

Figure 9 Connecting Console Port



Start a terminal application such as HyperTerminal on the computer. Configure with these parameters

- Default Baud rate—115,200 bps
- Parity—None
- Stop bit—1
- Data bits—8
- Flow control—none

The default username is "admin" and password is "admin".

Refer to the SM8TAT2DPB CLI Reference for command line interface (CLI) information.

## 3. Initial Configuration via Web GUI

After you power up the switch for the first time, you can configure the switch using a Web browser. For more information about managing the switch, see the *SM8TAT2DPB Web User Guide*.

To begin with the initial configuration stage, you must reconfigure your PC's IP address and subnet mask so as to make sure the PC can communicate with the switch. After changing PC's IP address (for example, 192.168.1.250), then you can access the Web interface of the switch using the switch's default IP address as shown below.

The factory default IP address of the switch is 192.168.1.77

The factory default Subnet Mask of switch is 255.255.255.0

## Initial Switch Configuration Procedure

The initial switch configuration procedure is as follows:

- 1. Power up the PC that you will use for the initial configuration. Please make sure the PC has the Ethernet RJ45 connector to be connected to the switch via standard Ethernet LAN cable.
- 2. Reconfigure the PC's IP address and Subnet Mask as below, so that it can communicate with the switch. The method to change the PC's IP address, for example, for a PC running Windows<sup>®</sup> 7/8.x/10, is as follows:

Step 1: Type "network and sharing" into the Search box in the Start Menu.

Step 2: Select Network and Sharing Center.

Step 3: Click on Change adapter settings on the left of PC screen.

**Note:** You can also skip step 1 to 3, by pressing **WinKey**+**R** and type "*ncpa.cpl*" command to get to step 4 directly.

Step 4: Right-click on your local adapter and select Properties.

Step 5: In the Local Area Connection Properties window highlight Internet Protocol Version 4 (TCP/IPv4) then click the Properties button.

**Note:** Be sure to record all your PC's current IP settings to be able to restore them later.

**Step 6:** Select the radio button **Use the following IP address** and enter in the IP for the PC (e.g., any IP address not in use, and in between *192.168.1.77* and *192.168.1.254*), Subnet mask (e.g. *255.255.255.0*), and Default Gateway that corresponds with your network setup. Then enter your Preferred and Alternate DNS server addresses.

**Step 7:** Click **OK** to change the PC's IP address.

- 1. Power up the switch to be initially configured, and wait until it has finished its start-up processes.
- 2. Connect the PC to any port on the switch using a standard Ethernet cable, and check the port LED on the switch to make sure the link status of the PC's is OK.
- 3. Run your Web browser on the PC, enter the factory default IP address to access the switch's Web interface.

If your PC is configured correctly, the switch login page displays as shown below.

Password	
Login	

#### Figure 9: Web Interface login page

If you do not see the above login page, perform the following steps:

- □ Refresh the web page.
- □ Check to see if there is an IP conflict issue.
- □ Clean browser cookies and temporary Internet files.
- □ Check your PC settings again and repeat step 2.
- 4. Enter the factory default username and password in login page, and click "Login" to log into the switch.

#### Note:

The factory default Username of the switch is **admin**.

The factory default Password of the switch is **admin**.

For more information about managing the switch, see the *SM8TAT2DPB Web User Guide*.

## 4. Troubleshooting

### **Troubleshooting Chart**

The following table lists Issues, Causes, and Actions to possible problems.

### Table 4 Troubleshooting Chart

Issue	Cause	Action
System LED is Off	The switch is not receiving power.	<ol> <li>Check if correct power cord is connected firmly to the switch and to the AC outlet socket.</li> <li>Perform power cycling the switch by unplugging and plugging the power cord back into the switch.</li> <li>If the LED is still off, try to plug power cord into different AC outlet socket to make sure correct AC source is supplied.</li> </ol>
System LED is Red	An abnormal state has been detected by the switch.	Check the system log within the switch from Web UI to view any abnormal state (e.g. exceeding operating temperature range) and take corresponding actions to resolve.
Port Status LED is Off in the Link/Act/Speed Mode	The port is not connected or the connection is not working.	<ol> <li>Check if the cable connector plug is firmly inserted and locked into the port at both the switch and the connected device.</li> <li>Make sure the connected device is up and running correctly.</li> <li>If the symptom still exists, try different cable or different port, in order to identify if it is related to the cable or specific port.</li> <li>Check if the port is disabled in the configuration settings via the Web UI.</li> </ol>
Port Status LED is Off in PoE Mode	The port is not supplying power.	<ol> <li>Check if the cable connector plug is firmly inserted and locked into the port at both the switch and the connected device.</li> <li>Make sure the correct Ethernet cables are used.</li> <li>If the symptom still exists, try different cable or different port, in order to tell if it is related to the cable or specific port.</li> <li>Check if the port is disabled in the configuration settings via Web UI.</li> </ol>

## 5. Specifications

## Hardware Specifications

Port Configuration	
10M/100M/1G RJ45 Ports	Eight (8 Gigabit PoE+ ports)
GbE RJ45/SFP Combo Port	Two (2 SFP/RJ-45 Combo ports)
Console Port	One RJ45 port
Total Ports	10 ports total
PoE Function	
IEEE802.3at (PoE+ 30W)	Yes
IEEE802.3af (PoE 15.4W)	Yes
PoE Ports	8 PoE+ ports
PoE Power	Max. PoE budget 130 Watts. (30 W for 4 ports simultaneously; 15.4 W for 8 ports simultaneously.)
Hardware Performance	
Switching Bandwidth	20 Gbps
Forwarding Performance	14.9 Mpps
MAC Addresses	8K
Jumbo Frames	9216 Bytes
Environmental Specifications	
Operating Temperature	0°C to 45°C (32°F to 113°C)
Storage Temperature	-20°C to 70°C (-4°F to 158°F)
Operating Humidity	10 to 90% RH
Storage Humidity	10 to 90% RH
Mechanical Specifications	
Dimensions (H) x (W) x (D)	44 x 220 x 242 mm (1.73 x 8.66 x 9.52 inches)
Weight	2.1 Kg. (4.62 Lbs.)
Fan Less	Yes
Power Source	
AC Input	100V-240V
Surge Protection	6KV

## Software Specifications

Layer 2 Switching	
Spanning Tree Protocol (STP)	<ul> <li>Standard Spanning Tree 802.1d</li> <li>Rapid Spanning Tree (RSTP) 802.1w</li> <li>Multiple Spanning Tree (MSTP) 802.1s</li> </ul>
Trunking	Link Aggregation Control Protocol (LACP) IEEE 802.3ad Up to 13 groups Up to 4 ports per group
VLAN	Supports up to 4K VLANs simultaneously (out of 4096 VLAN IDs) Port-based VLAN 802.1Q tag-based VLAN MAC-based VLAN Management VLAN Private VLAN Edge (PVE) Q-in-Q (double tag) VLAN Voice VLAN GARP VLAN Registration Protocol (GVRP)
DHCP Relay	<ul> <li>Relay of DHCP traffic to DHCP server in different VLAN.</li> <li>Works with DHCP Option 82</li> </ul>
IGMP v1/v2/v3 Snooping	IGMP limits bandwidth-intensive multicast traffic to only the requesters. Supports 1024 multicast groups
IGMP Querier	IGMP querier is used to support a Layer 2 multicast domain of snooping switches in the absence of a multicast router
IGMP Proxy	IGMP snooping with proxy reporting or report suppression actively filters IGMP packets in order to reduce load on the multicast router
MLD v1/v2 Snooping	Delivers IPv6 multicast packets only to the required receivers

Layer 3 Switching	
IPv4 Static Routing	IPv4 Unicast: Static routing
IPv6 Static Routing	IPv6 Unicast: Static routing

Security	
Secure Shell (SSH)	SSH secures Telnet traffic in or out of the switch, SSH v1 and v2 are supported
Secure Sockets Layer (SSL)	SSL encrypts the HTTP traffic, allowing advanced secure access to the browser-based management GUI in the switch
IEEE 802.1X	<ul> <li>IEEE802.1X: RADIUS authentication, authorization and accounting, MD5 hash, guest VLAN, single/multiple host mode and single/multiple sessions</li> <li>Supports IGMP-RADIUS based 802.1X</li> <li>Dynamic VLAN assignment</li> </ul>
Layer 2 Isolation Private VLAN Edge	PVE (also known as protected ports) provides L2 isolation between clients in the same VLAN. Supports multiple uplinks
Port Security	Locks MAC addresses to ports, and limits the number of learned

	MAC address
IP Source Guard	Prevents illegal IP address from accessing to specific port in the switch
RADIUS/ TACACS+	Supports RADIUS and TACACS+ authentication. Switch is a client
Storm Control	Prevents traffic on a LAN from being disrupted by a broadcast, multicast, or unicast storm on a port
DHCP Snooping	A feature acts as a firewall between untrusted hosts and trusted DHCP servers
ACLs	<ul> <li>Supports up to 256 entries. Drop or rate limitation based on:</li> <li>Source and destination MAC, VLAN ID or IP address, protocol, port</li> <li>Differentiated services code point (DSCP) / IP precedence</li> <li>TCP/ UDP source and destination ports</li> <li>802.1p priority</li> <li>Ethernet type</li> <li>Internet Control Message Protocol (ICMP) packets</li> <li>TCP flag</li> </ul>

Quality of Service	
Hardware Queue	Supports 8 hardware queues
Scheduling	<ul> <li>Strict priority and weighted round-robin (WRR)</li> <li>Queue assignment based on DSCP and class of service</li> </ul>
Classification	<ul> <li>Port based</li> <li>802.1p VLAN priority based</li> <li>IPv4/IPv6 precedence / DSCP based</li> <li>Differentiated Services (DiffServ)</li> <li>Classification and re-marking ACLs</li> </ul>
Rate Limiting	<ul> <li>Ingress policer</li> <li>Egress shaping and rate control</li> <li>Per port</li> </ul>

Management	
DHCP Server	Support DHCP server to assign IP to DHCP clients
Zero Touch Upgrade	Upgrade single switch automatically when you get notification
Remote Monitoring (RMON)	Embedded RMON agent supports RMON groups 1,2,3,9 (history, statistics, alarms, and events) for enhanced traffic management, monitoring and analysis
Port Mirroring	Traffic on a port can be mirrored to another port for analysis with a network analyzer or RMON probe. Up to N-1 (N is Switch's Ports) ports can be mirrored to single destination port. A single session is supported.
UPnP	The Universal Plug and Play Forum, an industry group of companies working to enable device-to-device interoperability by promoting Universal Plug and Play
s-Flow	The industry standard for monitoring high speed switched networks. It gives complete visibility into the use of networks

	enabling performance optimization, accounting/billing for usage, and defense against security threats
IEEE 802.1ab (LLDP)	<ul> <li>Used by network devices for advertising their identities,</li> <li>capabilities, and neighbors on an IEEE 802ab local area network</li> <li>Support LLDP-MED extensions</li> </ul>
Web GUI Interface	Built-in switch configuration utility for browser-based device configuration
CLI	For users to configure/manage switches in command line modes
Dual Image	Independent primary and secondary images for backup while upgrading
SNMP	SNMP version1, 2c and 3 with support for traps, and SNMP version 3 user-based security model (USM)
Firmware Upgrade	<ul> <li>Web browser upgrade (HTTP/ HTTPs) and TFTP</li> <li>Upgrade through console port as well</li> </ul>
NTP	Network Time Protocol (NTP) is a networking protocol for clock synchronization between computer systems over packet-switched
Other Management	<ul> <li>HTTP/HTTPs; SSH</li> <li>DHCP Client/ DHCPv6 Client</li> <li>Cable Diagnostics</li> <li>Ping</li> <li>Syslog</li> <li>Telnet Client</li> <li>IPv6 Management</li> </ul>

Power over Ethernet (PoE)	
Port Configuration	Supports per port PoE configuration function
PoE Scheduling	Supports per port PoE scheduling to turn on/off the PoE devices (PDs).
Auto-checking	Check the link status of PDs. Reboot PDs if there is no responses.
Power Delay	The switch provides power to the PDs based on delay time when PoE switch boots up, in order to protect switch from misuse of the PDs

.

## 6. Service, Warranty & Tech Support

## Warranty

#### Limited Lifetime Warranty

Effective for Products Shipped May 1, 1999 and After. Every Transition Networks labeled product purchased after May 1, 1999, and not covered by a fixed-duration warranty will be free from defects in material and workmanship for its lifetime. This warranty covers the original user only and is not transferable.

This warranty does not cover damage from accident, acts of God, neglect, contamination, misuse or abnormal conditions of operation or handling, including over-voltage failures caused by use outside of the product's specified rating, or normal wear and tear of mechanical components.

Transition Networks will, at its option:

- Repair the defective product to functional specification at no charge
- Replace the product with an equivalent functional product
- Refund a portion of purchase price based on a depreciated value

To return a defective product for warranty coverage, contact Transition Networks' Customer Support for a return authorization number.

Send the defective product postage and insurance prepaid to the following address:

Transition Networks, Inc. 10900 Red Circle Drive Minnetonka, MN 55343 USA

Attn: RETURNS DEPT: CRA/RMA # \_\_\_\_

Failure to properly protect the product during shipping may void this warranty. The return authorization number must be written on the outside of the carton to ensure its acceptance. We cannot accept delivery of any equipment that is sent to us without a CRA or RMA number.

CRA's are valid for 60 days from the date of issuance. An invoice will be generated for payment on any unit(s) not returned within 60 days.

Upon completion of a demo/ evaluation test period, units must be returned or purchased within 30 days. An invoice will be generated for payment on any unit(s) not returned within 30 days after the demo/ evaluation period has expired.

The customer must pay for the non-compliant product(s) return transportation costs to Transition Networks for evaluation of said product(s) for repair or replacement. Transition Networks will pay for the shipping of the repaired or replaced in-warranty product(s) back to the customer (any and all customs charges, tariffs, or/and taxes are the customer's responsibility).

Before making any non-warranty repair, Transition Networks requires a \$200.00 charge plus actual shipping costs to and from the customer. If the repair is greater than \$200.00, an estimate is issued to the customer for authorization of repair. If no authorization is obtained, or the product is deemed not repairable, Transition Networks will retain the \$200.00 service charge and return the product to the customer not repaired. Non-warranted products that are

repaired by Transition Networks for a fee will carry a 180-day limited warranty. All warranty claims are subject to the restrictions and conventions set forth by this document.

Transition Networks reserves the right to charge a \$50 fee for all testing and shipping incurred, if after testing, a return is classified as "No Problem Found."

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