GPNP Inc.

NT384 NT1
User Manual

Revision 1.00
17/6/2002

IMPORTANT SAFETY INSTRUCTIONS

When using your telephone equipment, basic safety precautions should always be followed to reduce the risk of fire, electric shock and injury to persons. The precautions are listed below.

1. Avoid installing phone line or using a telephone (other than a cordless type) during a lightning storm. There may be a remote risk of electric shock from lightning.

2. Never install telephone jacks in wet locations unless the jack is specifically designed for wet locations.

3. Do not use this product near water (for example, near a wash bowl, in a wet basement or near a kitchen sink).

4. Never touch un-insulated telephone wires or terminals unless the telephone line has been disconnected at the network interface.

5. Use only the power cord, power supply indicated in the manual.

FCC INFORMATION

FCC part 15, Class B

This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions:
(1) This device may not cause harmful interference.
(2) This device must accept any interference received, including interference that may cause undesired operation.

FCC part 68, Class B

1. This equipment complies with Part 68 of the FCC rules. On the bottom of the equipment housing is a label that shows the FCC registration number for this equipment.

Certified CAN/CSA STD C22.2 No. 950

DOC CS03

This device must be powered by a CSA approved power supply meeting the requirements of CS03, Part I Section 1.4.2.

CONFORMS TO ASNI/UL STD 1950.

WARRANTY AND CUSTOMER SERVICE

LIMITED PRODUCT WARRANTY

GPNP Inc. warrants that for two years from the date of shipment to Customer, all products manufactured by GPNP Inc. will be free from defects in materials and workmanship.

This warranty applies only to the original purchaser and is not transferable without GPNP Inc.'s permission.

This warranty becomes null and void if Customer modifies or alters the equipment in any way.

Repair and Return

GPNP Inc. will repair or replace this product within two years from the date of shipment if it does not meet its published specifications or fails while in service.

If GPNP Inc. Technical Support determines that a repair is needed, Technical Support will issue an Return Material Authorization (RMA) number.

Return Material Authorization (RMA) is required prior to returning equipment to GPNP Inc

Identify the RMA number clearly on the package (below address), and return to the GPNP Inc.'s customer support department.

Technical Support

If you experience technical difficulty with the NT384 please contact GPNP, Inc. at 510-438-8828 or support@gpnp.com for technical support.

Table of Contents

Figures

Tables

Introduction

The GPNP Inc. NT384 is a stand-alone device providing up to three basic rate interfaces between customer ISDN terminal equipment (S/T) and the basic rate ISDN network (U).

Figure 1 is a picture of the NT384.

Figure 1. GPNP Inc NT384.

Figure 2 shows the power and interface connectors at the rear panel of NT384.

Figure 2. Power and Interface Connectors

The left three RJ-45 connectors labeled **U** connect to the ISDN network. The RJ-45 connectors labeled S/T connect to the terminal equipment.

The NT384 is powered by an external power supply, which comes in two types. The type of power supply can be chosen by customer depending on the different operating environment:

The **40 Watt power supply** provides up to 40 watts of Power Source 2 (PS2) power which is commonly

used to power Terminal Equipment from the NT1 device. Most ISDN Telephone sets, including those with built in data capabilities, require PS2 power. The specifications or documentation of the TE will have information on the watts required by the device

The **10 or 16 Watt power** supply is normally used for Video Conferencing and, Data Equipments requiring no PS2 to function.

Unit	Input	Output
10Watt	100~240VAC@50~60Hz	+40VDC@250mA
16Watt	120VAC@60Hz	+48VDC@250mA
40Watt	90~264VAC@50~60Hz.	+42VDC@1A

Table 1. Power Supply Information

Package Contents

After unpacking the NT384, please carefully inspect it for shipping damage. If damage is suspected, file a claim immediately with the carrier and contact GPNP Inc. Technical Support department.

The NT384 package includes the following items:

One NT384 NT1 device
Three RJ-45 to RJ-45 cables
Three RJ-11 to RJ-45 hybrid cables.
One power supply (10Watt/16Watt or 40Watt)
Manual
Warranty Card
Wall-Mounting Kit (Optional)

If anything is missing, please contact GPNP Inc Technical Support department.

First thing first – Before the installation.

Before installing the NT384, the following items should be checked:

- LED Indicators
- Interface and Connectors
- DIP switch Setting.

LED Indicators

There are a total of four LED indicators (One POWER indicator and three **LINE** indicators) located on the front panel of the NT384. With these LED combinations, the user can easily to understand the current status of the NT384. Table 2 describes the status and descriptions of the LEDs

Table 2. LED Status.

LED type	STATUS	Description
POWER	**Solid Green**	**The unit is powered**
LINE	**Faster flash** Green (8 times per second)	**Waiting U interface synced.**
	Slower Flash Green (1 times per second)	**U is synced. Waiting ST interface ready**
	Solid Green	**U and ST are synced. The unit is ready to establish an ISDN connection.**

Interface and Connectors

Two types of interface connectors, **U and ST** interface connectors, which located at the rear panel, are provided by the NT384 unit. The U interface complies with ANSI T1.601 and ITUT1.430Recommendation Standard. The S/T interface complies with ANSI T1.605 and ETSI ETS 300012 Standard. Table 3 and 4 show the interface pin assignments.

Table 3. U Interface Pin Assignments

Pin #	Description
1	- (*Note)
2	-
3	-
4	U Network connection (Tip)
5	U Network connection (Ring)
6	-
7	-
8	-

* Note: "– "Stands for No Signal for connection.

Table 4. ST Interface Pin Assignments

Pin #	Description
1	-
2	-
3	ST interface Receive (RX+)
4	ST interface Transmit (TX+)
5	ST interface Receive (RX-)
6	ST interface Transmit (TX-)
7	GND for 40VDC
8	40VDC

DIP Switch setting for the typical configuration.

There are three sets of five DIP Switches on the bottom of the NT384, each corresponding to the appropriate line. The DIP Switches allow the user to adjust the S/T bus Terminating Resistor (TR) and S/T bus timing.

Details of each DI P Switch are given in Table 5.
The asterisks represent the default positions.

Setting	1	2	3	4	5
None	---	Off	Off	Off	Off
50	---	On	On	On	On
100	---	Off*	Off*	On*	On*
Adaptive	Off*	---	---	---	---
Fixed	On	---	---	---	---

Table 5. DIP Switch Position Assignments

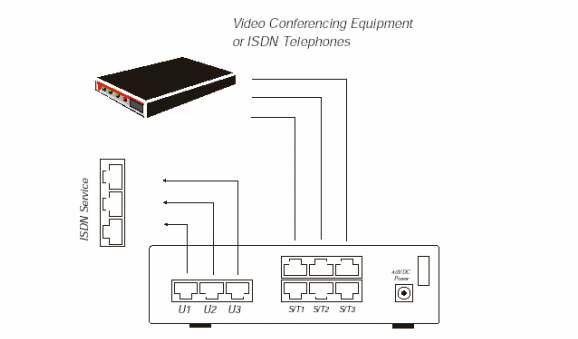
Since most Terminal Equipment (TE) requires 100 Ohm termination, the NT384 is being set as standard 100 Ohm termination. This default DIP switch setting should be able to work on almost all situations.

Any other configuration, for example TE requiring 50 Ohm termination, please studies its manual and then adjusts the DIP switch according to the instructions.

Installing NT384

After make sure that terminal equipment (TE) is properly terminated and finishing the adjustment of DIP switch setting of NT384 if necessary, we can start installing the NT384.

The typical connection of NT 384 with ISDN terminal equipment (TE), such as video conference equipment or ISDN Telephone set, is shown in Figure 3.



I. Powering with the Power Supply

To connect the NT384 to an external power supply, perform the following steps

1. Connect the external power supply to the NT384 at the POWER jack located on the rear panel.

2. Plug the power supply into the nearest wall outlet supplying120 VAC, 60 Hz.

3. On the NT384, verify that the POWER LED indicator is illuminated green and stay solid indicating the NT384 is working.

4. All the LINE LED indicators should flash green once to indicate that each interface is receiving power.

5. After approximately 3~5 seconds, the LINE LED indicators should flash at eight times per second (8 Hz rate) while trying to synchronizing with Central Office (CO).

Should any of the indicators fail to operate as stated, Please see the section Troubleshooting on page 7.

II. Connecting with the Network Interface Outlet

Use the RJ-11 to RJ-45 hybrid cables to connect the NT384 with Network Interface Outlet.

1. Connect the RJ-11 end of the hybrid cable to the U Network Interface Outlet which is usually provided by Telephone Company.

2. Connect the RJ-45 end of the hybrid cable to the U Network Interface connector on the NT384.

3. The LINE LED indicators should flash once per second (1 Hz rate) to indicate the U-Interface has synchronized with Central Office (CO) after a slight delay.

If the LINE LED indicator fail to operate as stated, Please see the section Troubleshooting on page 7.

III. Connecting the Terminal Equipment

Use the RJ-45 to RJ-45 cables to connect the NT384 with Terminal Equipment (TE).

1. Plug the TE into the ST connectors at the rear of the NT384.

2. After a few seconds, the LINE LED indicator should stop flashing and illuminate solid green to indicate the TE has synchronized with Central Office.

3. The installation is complete and the NT384 is fully working now.

If the LINE LED indicator fail to operate as stated, Please see the section Troubleshooting on page 7.

*Note

In order to achieve this synchronization, the TE should do the necessary setting. For instance, running software to set up the switch type and SPID for the equipment. Please read the TE's user's manual to do the necessary setting.

Maintenance

The NT384 requires no routine maintenance to operate.

Remote Loop Testing

Network test features include a Metallic Loop Test (MLT) initiated at the central office. This test is a lower power signal transmitted from Central Office (CO) and the NT384 will loop the signal back to the CO. It confirms network integrity to the NT384.

Troubleshooting

Please check the lists of situations and solutions below if your NT384 does not operate properly.

Situation	Possible solutions
POWER and **LINE** LEDs are not illuminated.	• Verify external power connection. • Call Technical Support for assistance.
LINE LED indicators flash faster at an 8 Hz rate.	• ISDN line not plugged into **U** jack: Plug ISDN line into **U** jack. • Wall jack wiring is incorrect: Check wall jack. • Problem with ISDN line: Contact Telephone company. • Call Technical Support for assistance.
LINE LED indicators flash slower at an 1 Hz rate.	• TE not connected properly: Connect TE. • TE not terminated properly: Adjust termination. • TE needs PS2 power from NT384: Using 40 W external Power Supply. • Call Technical Support for assistance.
Unable to make or receive a call.	• TE ISDN parameters not configured properly: Re-configure TE, such as setting of switch type, SPIDs, DNs, etc... • TE is not compatible with ISDN network: Contact Telephone company.

Specifications

Mechanical

Size: 2” High, 6.4” Wide x 7.5” Deep
(5.08 cm, 16.26 cm, 19.05 cm)
Weight: 2 lbs (0.91 Kg)
Mounting: Wall or desktop

Front Panel Indicators

POWER LED X1
LINE LEDs X3

Network Compatibility

U-Interface .....ISDN U
S/T-Interface .....ISDN S/T

Network Interface (U)

Line: 2-Wire (Tip and Ring)
Operating Mode: Full-Duplex
Data Rate: 144 kbps to customer
Line Code Format: 2B1Q
Output Amplitude: 2.5 volts, zero-to-peak
Connectors: RJ-45
Tx Source Impedance ...As per ANSI T1.601
Rx Source Impedance...As per ANSI T1.601
Receiver Sensitivity.....As per ANSI T1.601

Customer Interface (S/T)

Line: Four-Wire.
Operating Mode: Full-Duplex
Data Rate: 144 kbps to customer
Line Code Format: Alternate Mark Inversion (AMI), 100% duty cycle
Output Amplitude: 0.75 volt, zero-to-peak
Connector: RJ-45
Tx Source Impedance ...As per ANSI T1.605
Rx Source Impedance...As per ANSI T1.605
Receiver Sensitivity.....As per ANSI T1.605

Power Supply Specifications

Power Input: 110 VAC, 60 Hz
Power Output: 10/16 W or 40 W
Output Voltage: 40 ~ 48 VDC, 250 mA (10/16 W PS)
42 VDC, 1A (40 W PS)

Environment

Operating Temperature: 0 to 50 °C (32 to 100 °F)
Storage Temperature: -20 to 60 °C (-4 to 140 °F)
Relative Humidity: Up to 95%, non-condensing.