

# NT1B-310 Installation Instructions

## Introduction

Use these instructions to install the AT&T Model NT1B-310 Rack used with the Model NT1B-300 network termination unit. For more information concerning ISDN equipment, refer to the AT&T ISDN Customer Premises Planning Guide (AT&T 533-700-100).

## Important Safety Instructions

When installing and operating this equipment, basic safety precautions should always be followed to reduce the risk of fire, electric shock and personal injury:

- Read and understand all instructions.
- Do not attach the power supply cord to building surfaces.
- Follow all warnings and instructions marked on the products.
- Clean products only with a dry cloth.
- Do not use this product near water.
- For mounting security, follow all installation instructions when mounting product.
- Openings on top and bottom of power unit are provided for ventilation. To protect it from overheating, these openings must not be blocked or covered. Do not exceed recommended environmental temperatures.
- Operate these products only from the type of power source indicated on the product labels.
- Do not allow anything to rest on or spill into the products.
- To reduce risk of fire and electrical shock, do not overload power outlets.
- Never push objects of any kind through the power supply or distribution unit slots as they may touch dangerous voltage points or short out parts, which could result in a risk of fire or electrical shock.
- To reduce risk of electrical shock, do not disassemble these products but return them for repair when needed. Opening or removing covers may expose you to dangerous voltages or other risks. Incorrect reassembly can cause electric shock when the products are subsequently used.
- Power down unit (disconnect AC power cord from outlet) and refer servicing under the following conditions:
  - if liquid has been spilled into the product
  - if the product has been exposed to water
  - if the product does not operate normally
  - if the product has been dropped or damaged
  - if the product exhibits a change in performance.
- Use caution when installing or modifying telephone wires.

- Never install telephone wiring during a lightning storm.
- Never install telephone jacks in wet locations unless the jack is specifically designed for wet locations.
- Never touch noninsulated telephone wires or terminals unless the telephone line has been disconnected at the network interface.
- For powering, use only a Telecommunication Level Power Source.
- When connecting to terminal equipment between buildings, you must provide lightning protection (locally engineered). See the AT&T ISDN Customer Premises Planning Guide (AT&T 533-700-100) for more information.

## Features

- Houses Multiples of 12 NT1s - Each NT1B-310 rack houses up to 12 NT1B-300 devices. Each NT1 supports up to eight ISDN terminal devices on a passive bus.
- Modular Design - The power for two or more racks can be daisy-chained. The example above shows two 12-position racks joined together with large L-brackets.
- One power supply provides enough power for two 12-position racks.
- Cabinet or Wall Mount - The rack can be installed on 19- or 23-inch centers in an equipment cabinet, or it can be installed on a wall by changing the position of the mounting brackets.
- Integrated or Separate Power Supply - The NT1B-310 can be ordered with an integrated Model 1144A1 -48V power supply or it can be ordered without power. The Model 1145B1 power supply with battery backup is an optional power source.
- Backup Power - When using the Model 1144A1 power supply, an off-the-shelf Uninterruptible Power Supply (UPS) can be installed for power holdover. When using the Model 1145B1 power supply, battery backup is provided in either 2.5 ampere-hours (AH), 5.0 AH, or 8.0 AH.
- Standard cross-connects - The T interface, U interface, and power connections are made through 50-pin amphenol cables to a cross-connect distribution panel.
- Lightweight and compact - A fully-loaded 12-position rack weighs about 4.5 pounds and the 1144A1 power supply weighs about 4.7 pounds. A fully-loaded 24-position rack with 1144A1 power supply weighs about 13.7 pounds. The 12-position rack measures 17.3 inches wide, 3.4 inches high, and 5.3 inches deep. A 24-position rack measures 17.3 inches wide, 6.9 inches high, and 5.3 inches deep. The 1144A1 power supply measures 9 inches wide, 6.3 inches high, and 3.8 inches deep.

## Power Engineering

This section provides some brief power engineering examples. See the AT&T ISDN Customer Premises Planning Guide (AT&T 533-700-100) for more detailed

descriptions of power engineering and power required for different ISDN terminals (phones and terminal adapters).

The 1144A1 and 1145B1 power supplies have an output of 200 watts. This power is distributed to the NT1B-300s installed in the racks and the ISDN terminals connected to the NT1s. Statistically, either of these power supplies provide enough power for a fully-loaded 24-position rack with each NT1 connected in a multipoint configuration (two ISDN terminals for each NT1). *Note: Up to eight ISDN terminals can connect to the NT1, but the rack power supply can only supply power for two of the terminals,*

Each NT1 consumes about 0.65 watts. In a fully loaded 12-position rack, the NT1s consume about 8 watts, which leaves 192 watts available for ISDN terminals connected to the NT1s. The NT1B-310 rack, though, has current limiters that reduce the usable power to 144 total watts per rack. That computes to an average available power of 12 watts for each ISDN terminal connected in a point-to-point configuration (one terminal per NT1). If each NT1 is connected to two ISDN terminals in a multipoint configuration, the average available power is 6 watts per ISDN terminal.

In a fully loaded 24-position rack with one power supply, the NT1s consume 16 watts. This leaves 184 watts available for ISDN terminals connected to the NT1s. That computes to an average available power of 7.6 watts for each ISDN terminal connected in a point-to-point configuration (one terminal per NT1). If each NT1 is connected to two ISDN terminals in a multipoint configuration, the average available power is 3.8 watts per ISDN terminal.

### Equipment Cabinet Installation

On a two-rack installation using the 1144A1 power supply, the L-brackets can be used on either 19-inch or 23-inch centers. The 1144A1 power supply and the DC power cables are installed at the factory. The power, T interface, and U interface cables attach to the back of the racks and are routed through the cabinet as defined by local practices.

*Note: Install the NT1B-310 rack(s) before you insert the NT1B-300s into the rack.*

### Wall Installation

This section shows different ways you can attach the NT1 rack to a wall. The recommended method is to attach the equipment to a 3/4-inch plywood wall. If you are attaching the rack to a wood wall, use the wood screws provided with the rack. If you are attaching the rack to a plasterboard wall, you should use wall anchors or moly-bolts to secure the rack.

*Install the NT1B-310 rack(s) before you insert the NT1B-300s into the rack.*

To install the racks on a wall, you must use the small L-brackets attached at right angles to the ends of each rack. You can install only 12-position racks on a wall; the 24-position racks must be disassembled into 12-position racks before you install them on a wall. If you do not have the small L-brackets, you must order two for each 12-position rack.

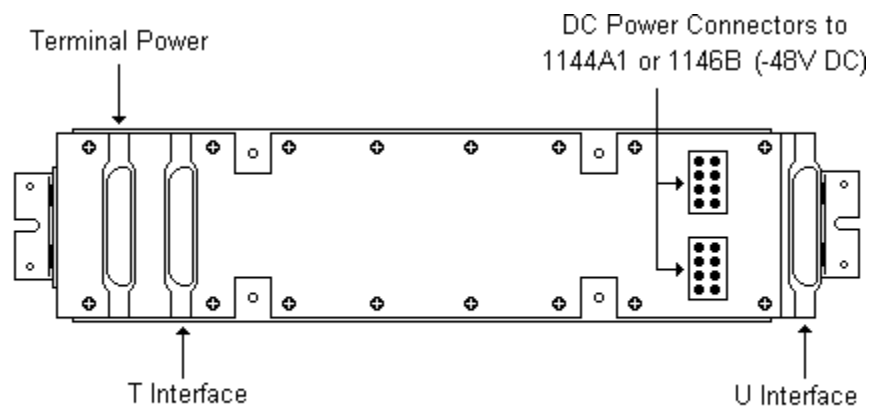
### Installation with an 1145B1 Power Supply and an 1146B Distribution Unit

The H600-342, Group 2 DC power cable must be modified to work with the 1146B distribution unit. Clip off a connector from one of the ends of the cable. Two of the wires in the cable must be punched-down on the 1146B to route power to the rack. The other end of the cable plugs into the back of the NT1 rack. The following table shows the power leads you punch down with this cable (*Note: Do not punch-down any other wires in the cable*):

Leads	Pin	Color
-48V	8	Red
-48VRTN	3	Blue/Black

### Wiring and Cross-Connects

On the rear of the NT1 B-310 rack, there are three 50-pin connectors used to make the Terminal Power, T Interface, and U Interface connections to your wiring distribution panels. The connections to the distribution panel should be completed before you plug in the rack power supply.



**NT1B-310 Rear Panel Connectors**

**Warning: Do not connect the cable for the Terminal Power connections to either the U Interface or T Interface connectors. This will damage the NT1B-300 units.**

*Note: Do not make any connections to the Terminal Power connector if the rack is powered by the 1145B1 / 1146B power supply and distribution unit. All power connections originate with the 1146B.*

The pinouts for the Terminal Power, T Interface, and U Interface connections are given in the following tables:

### Terminal Power Connector Wiring

NT1 No.												
Signal	1	2	3	4	5	6	7	8	9	10	11	12
-48V 1	1	3	5	7	9	11	13	15	17	19	21	23
RTN 1	26	28	30	32	34	36	38	40	42	44	46	48
-48V 2	2	4	6	8	10	12	14	16	18	20	22	24
RTN 2	27	29	31	33	35	37	39	41	43	45	47	49

### T Interface Connector Wiring

NT1 No.												
Signal	1	2	3	4	5	6	7	8	9	10	11	12
Transmit (+)	1	3	5	7	9	11	13	15	17	19	21	23
Transmit (-)	26	28	30	32	34	36	38	40	42	44	46	48
Receive (-)	2	4	6	8	10	12	14	16	18	20	22	24
Receive (+)	27	29	31	33	35	37	39	41	43	45	47	49

### U Interface Connector Wiring

NT1 No.												
Signal	1	2	3	4	5	6	7	8	9	10	11	12
Ring	1	3	5	7	9	11	13	15	17	19	21	23
Tip	26	28	30	32	34	36	38	40	42	44	46	48

## Installing the NT1B-300 Units

After you have installed the racks, connected the distribution cables, and determined the number of NT1s you need in each rack, you must now install the NT1s in the rack. Loosen the thumbscrews on the locking bracket, take the bracket and screws and set them aside, and then slide the NT1 B-300 units into the rack. The NT1B-300s are installed correctly when the status lamps are visible from the front of the rack and are in the upper-left corner of each slot. After you have installed the NT1s, reinstall the locking bracket.

## Applying Power

The power supply is powered by a 110V AC unswitched power outlet protected by a 20-amp circuit breaker. Up to four power supplies can be connected to one dedicated 20-amp circuit. After the racks and NT1s are installed and wired, power-up and test the supply as described in the power supply installation instructions.

Once power is applied, the NT1 status lamps display the current line status. See the NT1B-300 Installation Instructions to determine the status of the units. The NT1s can be removed or added to the racks without removing power to the rack.

## Additions

New NT1B-310 racks can be added to existing installations as more ISDN terminals are installed. If the racks were wall-mounted, you would simply install new racks on the wall. The DC power cables can be daisy-chained between several units (use an H600-342, Group 2 DC power cable). As you add new racks, remember to reengineer your power usage so the power supply is not overloaded. Statistically, one power supply is enough for up to 48 ISDN terminals. If you need to power more than 48 ISDN terminals, you must add another power supply.

The same constraints apply to additions to an equipment cabinet. If you are adding a single rack to another rack, you can either join the two racks together using the large L-brackets, or you can install each rack separately using the small L-brackets.

If you have one 12-position rack powered by the 1145B1 power supply and you add another 12-position rack, you must order a 107587958 upgrade kit. The kit includes an 1146B distribution unit, an H600-342, Group 7 DC power T-cable, and a spacer used when you install the distribution unit next to the battery on the mounting plate. The DC power T-cable replaces the existing DC power cable; it connects the power supply to both distribution units. The power distribution for the second rack comes from the new distribution unit.