

Application Note:

Testing Natural MicroSystems T1 Cards with the TSP

This application note provides guidance for setting up the Telecom Simulation Platform (TSP) to connect to Natural MicroSystems (NMS) T1 cards in minimal time. This note provides essential information to get the NMS T1 cards configured in wink start mode (which is one of the more common signaling types) and accepting calls from the TSP using the incta demonstration program provided by NMS.

Background

The standards for digital A&B robbed-bit signaling are defined in the EIA/TIA *Requirements for Private Branch Exchange (PBX) Switching Equipment* (Standard EIA/TIA-464-B). This standard contains tables defining the transmit and receive bit patterns for all common robbed-bit signaling types. For some signaling types, the received B-bit is defined with an X, where “*an X indicates that the received signaling bit is not required for determining the signaling state and, depending on the terminating equipment, may be an unreliable source of such information. Therefore it should be ignored.*” (EIA/TIA-464-B, page 147, Section 6.2.1.3).

Once a protocol is selected on the TSP’s templates screen, variations of the signaling can be selected on the Signaling tab. The default signaling-bit settings on the TSP comply with the standard except they **do not** ignore the B-bit. This ensures that designers of new equipment can test that their systems are properly transmitting the signaling per the standard. This, however, causes problems for equipment that does not transmit per the standard.

The EIA/TIA-464B selection on the TSP Signaling tab is more forgiving, ignoring unnecessary signaling bits. When you do not know the details about the signaling of the equipment you are connecting to, the EIA/TIA-464B selection is best initially. Other selections may be available for specific equipment that has been tested with the TSP, and users can define their own signaling patterns if needed.

The NMS T1 card does transmit the B-bit per the standard by default, and the TSP’s default signaling work with it. The TSP’s EIA/TIA-464B and Natural Microsystems WNK0 selections may also be used.

Setup and Test

You will need the following items:

- TSP base unit with a Single or Dual T1
- NMS T1 Card

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- NMS agmon software (used to control card operation). This is part of the NMS Natural Access SDK.
- Inbound call demo software ,incta, which is installed as part of NMS Natural Access. Refer to the Natural Access Developer's Reference Manual.

Setting Up the TSP Program

1. Connect from the TSP T1/E1 module port to the NMS T1 port with the yellow T1/E1 cable provided.
2. Launch the Telecom Simulation Platform program and create a Unit.
 - a. Ensure the Slot 2 on the Units screen is set for either the Single or Dual T1/E1 card type (matching card in unit) and the Card Mode is set to T1.
 - b. Set the T1 Parameters of the TSP as follows to match the NMS card's default parameters.

Clock:	Internal
Framing:	D4
Line Coding:	AMI
PCM Encoding:	mu-law



Note: TSP Clock is set for Internal (provides the timing reference) since the NMS card's default is set for external timing.

- c. Go to the Channels Tab and program the Transmit Digits field with ANI and/or DNIS that will be sent to the channels being tested. Use the Wizard button to do all channels at once, using the defaults provided.
 - d. If there are other cards installed in the TSP, ensure that they are properly set in the appropriate Slot tabs.
3. Create a new Template using T1 Wink Start channel protocol.
 - a. Use all the defaults on the Type and Timings tabs.
 - b. Go to the Signaling tab and choose *Natural Microsystems WNK0 by clicking the arrow under "T1 Wink Start". The * indicates this is a default protocol provided by Teltone.
 4. Create a new control set using Call Originate control set type with the TSP Configuration Software.
 - a. Choose the T1 Wink Start template created earlier by clicking the arrow for the Template field and selecting the name it was given.

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- b. Choose the channel to be tested by clicking the Edit Channels button and moving an Available Channel to the field on the right side. Start by choosing only channel 1 of the T1.
- c. Click OK.
- d. Leave the Start set to Manual (default).
- e. Click the radio button for Number of calls in the Stop section and program for 1 call.
- f. Click OK on the Control Set screen.

The TSP is ready to test, but the NMS T1 card needs to be programmed first.

Setting Up the NMS T1 Card

1. Install the NMS T1 card and the Natural Access software and its SDK.
2. Refer to the NMS installation manual for the specific board that you have installed and create the `ag.cfg` file from the sample configuration files, which NMS provides. If there is more than one sample file for the board you are using, select the one for T1 operation with the `wnk0` (wink start) protocol enabled.
3. Launch the `agmon` program to configure and activate the NMS card.
4. Verify that no errors are reported. A green light indication appears on the NMS card when the T1 is in sync with the TSP. The TSP shows a green light on the module port.

Testing

Ensure that testing is done in the following order:

1. From a DOS prompt, enter `incta -pwnk0` to launch the inbound call demo program. Refer to the NMS Natural Access Developer's Reference Manual for details about this program. The NMS card is ready to receive calls.
2. Activate the control set on the TSP by clicking the button at the right of the Telecom Simulation Platform screen under "Control Set Enables".
The TSP immediately places a call to the NMS card on channel 1 of the T1.
The incta program indicates the call progress and the first three digits received from the TSP.
3. Repeated calls may be placed into the NMS card from the TSP by disabling and re-enabling the control set.