NOTIFIER NCB-IM Network Combiner Router Instruction Manual

Contents

NOTIFIER by Honeywell

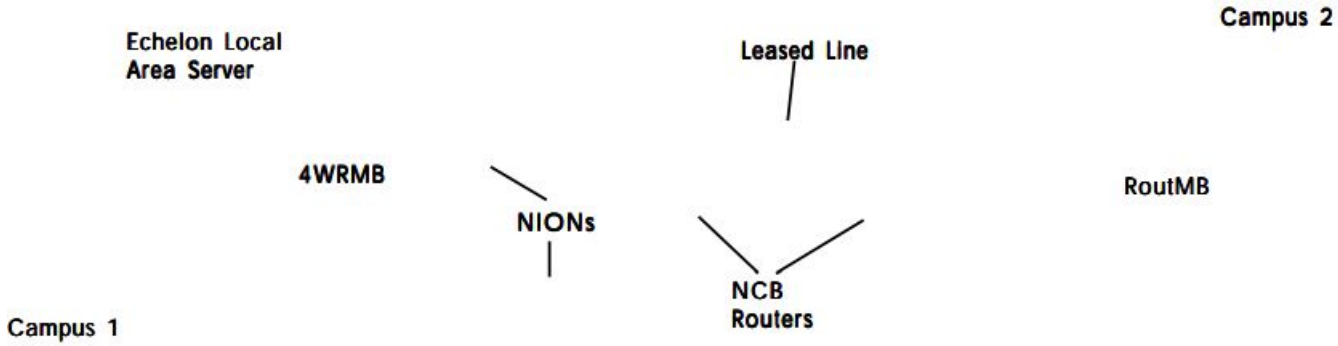
NOTIFIER NCB-IM Network Combiner Router

Product Installation Document

This document covers the procedures and specifications for installing the above listed unit and when appropriate, information regarding configuration on the monitored device. For more detailed configura-tion and operation information, refer to the Network Installation Manual or Echelon Local Area Server Manual as appropriate.

NCB/IM Network Combiner Routers

The NCB router is an Echelon network device that, when used in pairs, allows the connection of multiple Echelon networks in real time, spanning great distances. The communication channel between these devices can be any analog or digitized analog channel capable of supporting V.32 turbo standard modem signalling, including standard dial up public switched telephone circuits, 2-wire or 4-wire leased lines or dry copper CAT 5 cable (dry copper mode uses leased-line configuration over shorter distances). Data transfer between routers is delayed only by the transit time through the routers and modem connections.
This technology allows the connection of Echelon network segments isolated by great distances, which cannot be spanned by conventional wire media. A typical application would be connection of Echelon networks on multiple campuses.



The following instructions describe the steps and parts required to install NCB routers. Needed for Installation:

1. NCB/IM Network Combiner Module.
2. SMX Echelon network transceiver.
3. NCB Power Supply (24 Volt DC 400mA, center POSITIVE, outer NEGATIVE).
4. Telephone wire media with RJ11 termination.
5. NIS CAB-5.
6. HSP-121B Surge Suppressor.
7. DITEK 2MLPL110B or EDCO PC2TEL line protectors.
   Use of the NCB requires the use of surge suppression devices installed with the unit in the NIS CAB-5 enclosure described in section seven – Enclosures. Primary power protection is provided by an HSP-121B power line surge suppressor.

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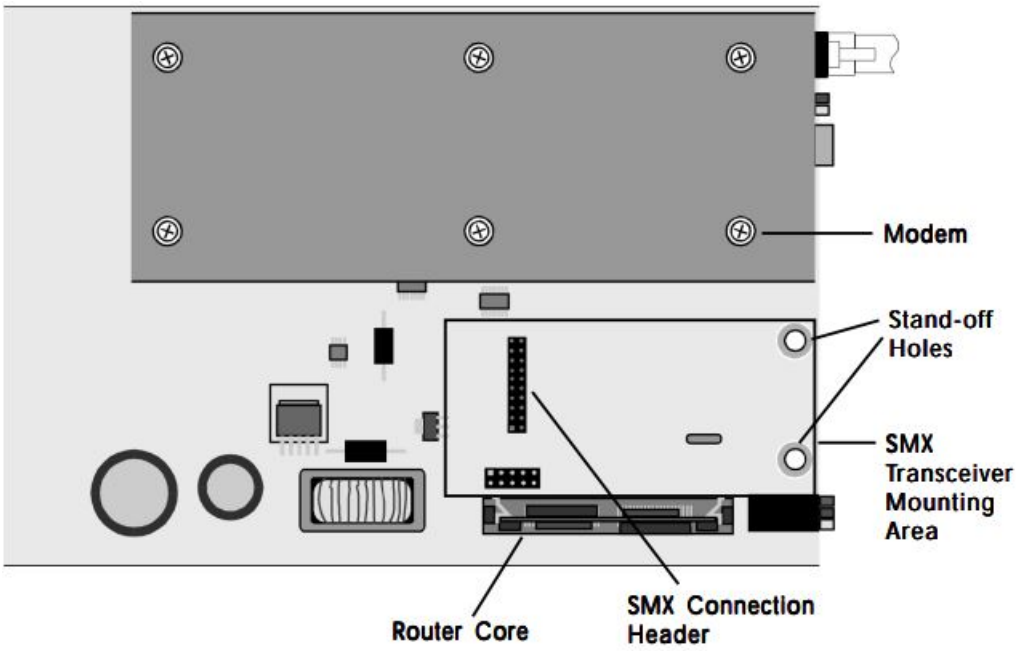
Installing the Network Transceiver

Each NCB router requires an SMX network transceiver for connection to the local Echelon network segment. Any standard network transceiver is supported by the NCB module. To install the transceiver, perform the following steps:

1. Remove the back plate of the NCB router.
2. Carefully remove the router motherboard from the enclosure.
3. Mount stand-offs provided with the transceiver to the motherboard (refer to figure 1-9).
4. Carefully mount the network transceiver by seating the header socket on the NCB SMX header.
5. Replace the motherboard in the NCB enclosure (be sure to attach network media to the network connector on the transceiver first) and replace the back cover.



NCB Router Mother Board

NOTE: DO NOT remove or replace the motherboard from the front panel of the enclosure. Doing so may damage the unit, causing the unit to malfunction when powered on. Doing so will void the unit's warranty. Always remove and replace the motherboard from the rear of the enclosure.

NOTE: Always remove power from the unit before making any changes to switch settings and removing or installing SMX network transceivers, or damage may result. Always observe ESD protection procedures.

Installing the NCB in the NIS CAB-5

Mount a UL listed, single gang electrical box in the NIS CAB-5 back box using self tapping screws provided. Mount the HSP-121B to the box using studs provided. Once mounted, install a single, grounded electrical outlet in

the box and connect the output from the HSP-121B. The HSP-121B must be connected to primary power through conduit using knockouts supplied.

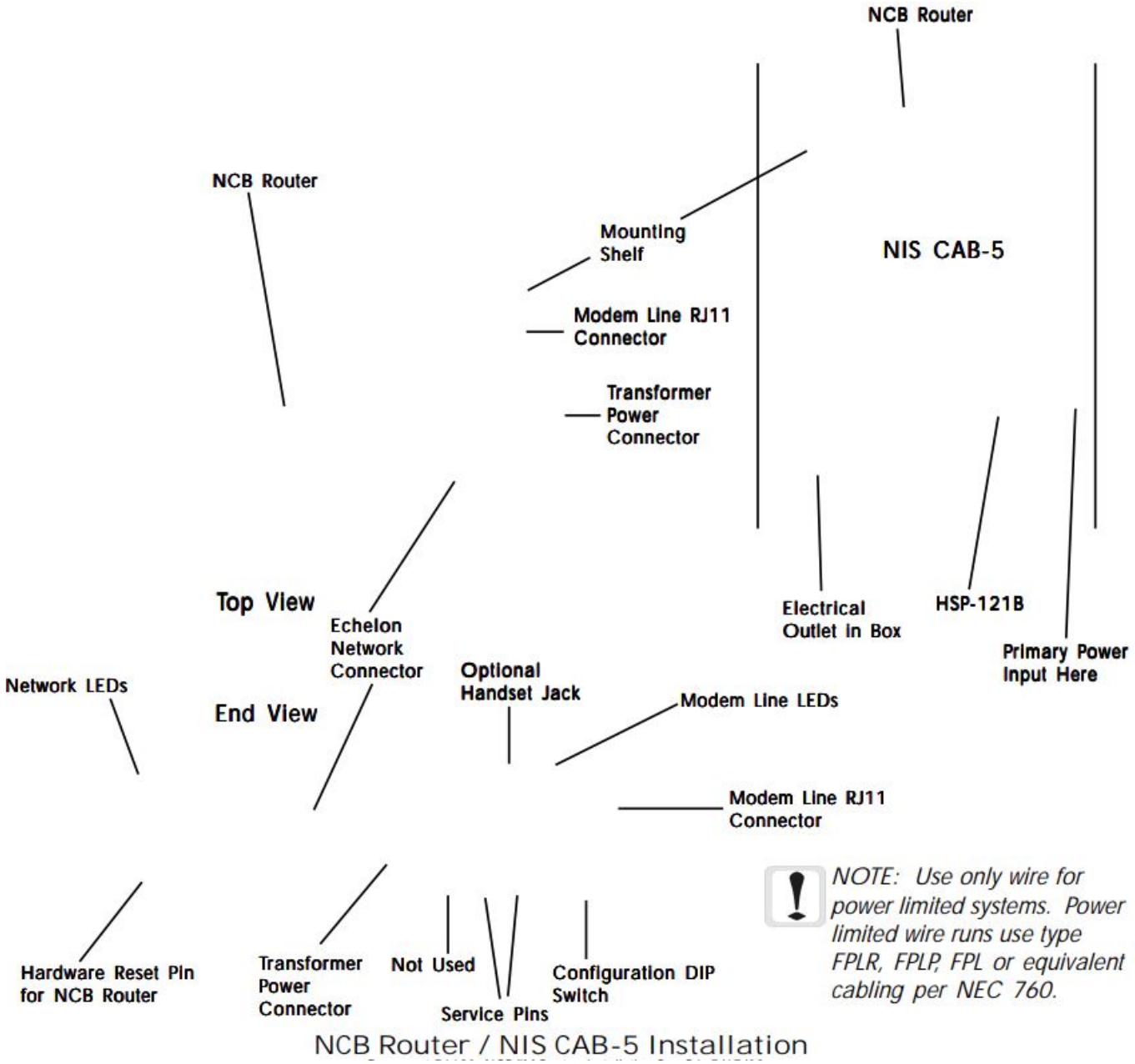
1. The NIS CAB-5 is provided with three shelves and stand-offs for assembly of a shelf unit; however, only the top shelf is required for this application.
2. Install the shelf according to the following illustration.
3. Run the echelon network lines to the cabinet in conduit. Connect the network wires (or fiber) to the SMX network transceiver.
4. Connect the telephone line to the Modem Line port on the NCB router using an RJ11 connector.
5. Connect the NCB router transformer power plug to the power connector on the unit and slide the unit and shelf into the cabinet.
6. Plug the NCB router power transformer into the electrical outlet.
7. Follow the steps in the following sections to install the software and configure the server.
   NOTES: The NCB power supply unit requires 115 VAC, 60Hz primary power.
   A UPS (Uninterruptable Power Supply) which is UL listed for use with fire protective signalling units is required for each unit.

NCB/IM Router Versions

NCB/IM routers are configured to communicate through a Local Area Server. The steps involved in configuring these routers with the Local Area Server vary depending on the version number of the NCB/IM. The version number of the router is located on the backplate of the router in the lower left corner of the label. The version appears in the format UXXX where XXX is the version. For example a label showing U325, like below, would be version 3.25 of the NCB/IM router.

NCB/IM Backplate and Label

If the NCB/IM router being configured is a version prior to 3.00 then follow the configuration directions entitled NCB/IM Router Configuration for Router Versions Prior to 3.00.
For NCB/IM routers version 3.00 or later refer to the section entitled NCB/IM Router Configuration for Router Versions 3.00 or Later.



NCB Router / NIS CAB-5 Installation

Telephone Line / Modem Connections

The NCB router's on-board modem can operate under PSTN (dial-up) or leased-line modes. Each of these modes has different configuration and connection requirements.

PSTN – dial-up connections use a 2-wire connection to a standard dial-up telephone circuit. A standard telephone cord can be used. FCC and Canadian registration numbers as well as ringer equivalence and load number information are labeled on the bottom of each NCB unit. For configuration information, refer to the Router Configuration part of this section.

Leased-Line – this connection style can use either a 2-wire or 4-wire connection to a dedicated leased-line circuit. In 2-wire leased-line mode, the audio circuit must pass audio in both directions simultaneously. Some leased-line audio circuits (most notably microwave RF channels) provide a 4-wire circuit consisting of a transmit pair and a receive pair. Use the 4-wire settings in these situations.

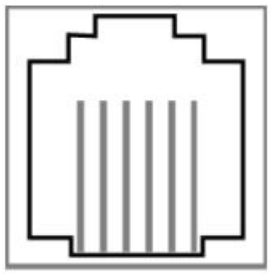
NOTES: Telephone circuit technical parameters may vary among service providers in different parts of the country. Therefore, when ordering 2-wire or 4-wire leased-line telephone circuits, be sure to specify an "analog leased-line data circuit for 19.2 kbps modems".

Use of 4-wire leased-line circuits requires the use of line protection devices at both modems which are UL listed for this purpose to UL Standard 1459. These devices must be mounted in their own enclosures adjacent to the NIS CAB-5 with all connections run in conduit.

All telephone line connections are made to the Line connector on the NCB router. Wire connections are as follows:

Modem Line RJ11 Pin-Outs:

1. No Connection
2. 4 wire receive tip (4-wire channels only)
3. 2 wire tip / 4 wire transmit tip
4. 2 wire ring / 4 wire transmit ring
5. 4 wire receive ring (4-wire channels only)
6. No Connection



6 5 4 3 2 1

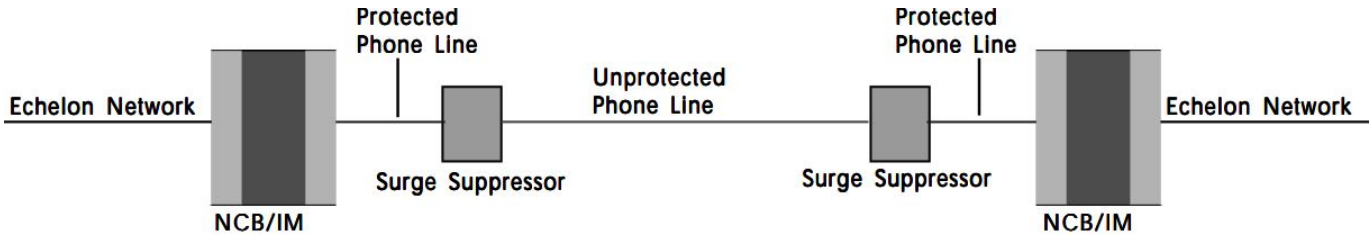
For 4-wire leased-line operation

- connect pins 3 and 4 of NCB module 1 to the circuit carrying audio from NCB1 to NCB2, terminate this circuit to pins 2 and 5 of NCB2.
- connect pins 2 and 5 of NCB module 1 to the circuit carrying audio from NCB2 to NCB1, terminate this circuit to pins 3 and 4 of NCB2.

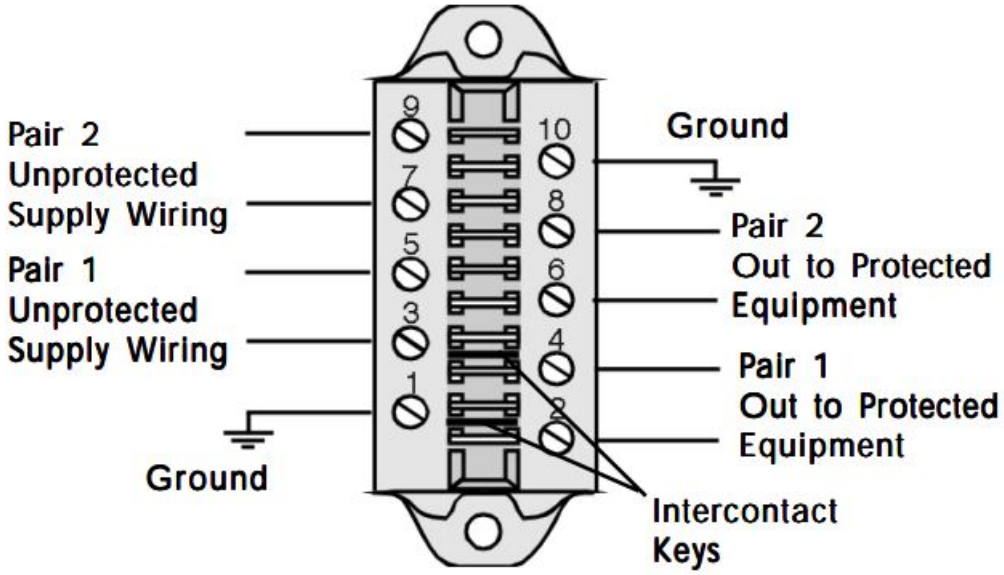
Telephone Line Surge Suppression
All telephone line connections require the use of surge suppression devices on the circuit. Accepted manufacturers and models are:

- DITEK – 2MLPL110B
- EDCO – PC2TEL

These devices must be mounted in their own enclosures adjacent to the NIS CAB-5 with all connections run in conduit. The following illustration is a typical installation block diagram.



The DITEK and EDCO modules are identical in both installation and operation. The illustration on this page shows wiring terminations for up 2-pairs of wires and is typical for both manufacturer's models.



DITEK or EDCO Wiring Block

NCB/IM Router Configuration for Router Versions Prior to 3.00
NCB routers are always used in pairs with one at each end of the telephone line. Consequently, of each pair, one must be set to Originate communication and the other to Answer. This applies to both dial-up and leased-line modes. Initial router configuration is handled by a set of DIP switches on the front of each router labelled OPTION A.
DIP switch settings for NCB/IM routers prior to version 3.00:

Switch # Function

1. Up: Modem in Answer Mode
   Dn: Modem in Originate Mode
2. Up: Modem Dial-Up Mode
   Dn: Modem Leased-Line Mode
3. Not Used, leave up
4. Not Used, leave up
5. Up: Enable setting of the control Neuron processor address.
   Dn: Disable setting of the control Neuron Processor address.
6. (Functions only if switch 5 is in Up position)
   Up: Control Neuron processor subnet/node address = 255/2
   Dn: Control Neuron processor subnet/node address = 255/1
7. Up: -10 dBm Modem Tx Level (normal)
   Dn: -16 dBm Modem Tx Level (back-to-back leased-line connection)
8. Leased-Line Mode 2-wire/4-wire Select
   Up: 2-wire
   Dn: 4-wire
   NOTE: The Reset Pin on the NCB router must be pressed after making changes to the Switch settings.
   NOTE: Option A, switch 7 should only by placed in the down position for testing purposes where both routers are separated by only a few feet – for example on a test bench.

Option A DIP Switch Settings

Dial-Up:

Unit 1 (Originate): DU UU DD UU

Unit 2 (Answer): UU UU DD UU

D = Down U = Up

Leased-Line - 2-wire:

Unit 1 (Originate): DD UU DD UU

Unit 2 (Answer): UD UU DD UU

Leased-Line - 4-wire:

Unit 1 (Originate): DD UU DD UD

Unit 2 (Answer): UD UU DD UD

NCB Router LEDs

On each NCB router are five LEDs which provide network and modem diagnostic information. These LEDs function as follows:

- PWR (green) – indicates power status for the module.
  - Flashes if DC input to module is below minimum required voltage.
  - Flashes for two seconds if a Wink network message is sent to the network processor.
- ERR (red) – indicates either:
  - Always on: a diagnostic error has occurred.
  - Slow flash or always on: insufficient configuration information is present.
- ACT (yellow) – indicates a packet has been passed by the router.
- OH (green) – indicates the modem is off hook.
- CD (yellow) – indicates the modem has detected carrier and completed connection with the distant mode

Handset Connection

A standard telephone handset may be connected to the AUDIO connector to allow use of the simultaneous voice/data feature of the NCB router. Audio directly from the telephone circuit is routed to this connector during modem dialing and training to permit monitoring of call establishment (as typical modems provide via an internal speaker). After training is completed (when the CD LED turns on), bidirectional audio from the simultaneous voice/data system is available at this connector. The audio on this connector is digitized and transferred across the modem link by utilizing a portion of the connection bandwidth. This utilization is dynamic and only consumes bandwidth when audio is detected into the AUDIO connector.

NOTE: Data throughput across the modem channel is decreased by 7200 bps when audio input is detected at either handset. To maximize data throughput, we recommend that handsets be normally left disconnected.

NCB Binding and Programming

NCB routers must be added or inserted in the Echelon network like any standard router and bound using the same router inserting tools described in section 2.4 of the Local Area Server manual.
No modem programming is required for leased line or dry copper installations; however, for dial up operation, some configuration must done for the modems to communicate. A programming utility is included in the server which performs this function once all physical connections and switch settings have been done.
The following paragraphs explain the steps to bind and configure a pair of NCB routers.

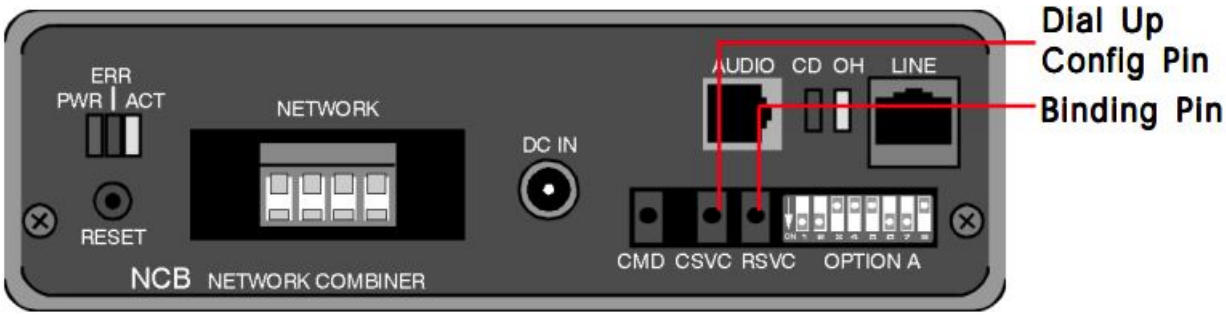
Leased Line Modem Steps

Before performing any configuration steps, be sure the routers have been installed and switch settings are correct for leased line mode operation.

1. Bind the first (originating) router to the server as normal; this is described in section 2.4 of the Local Area

Server manual. The bind pin on the router is marked RSVC per the illustration below.

2. After the modem side of the routers have been connected and configured, bind the far router (answering) to the network in the same manner described in step one.
   NOTE: All hardware setup information, including switch settings, wiring and mounting are contained in the Network Install manual in the Routers section.



NCB Router End Panel

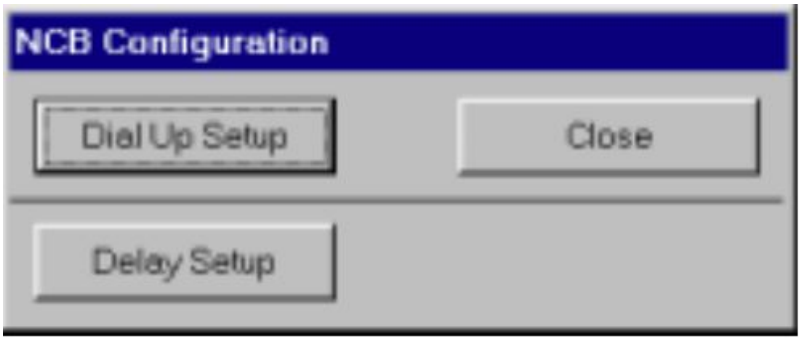
Dial Up Modem Steps

For NCB routers used on a dial up phone line two parameters must be configured for proper operation in the first (originating) router modem:

- A. Enter the complete phone number of the second (answering) NCB.
- B. Verify that Perpetual Connect Mode is active so that the originating router will always maintain and establish a connection with the answering NCB router.

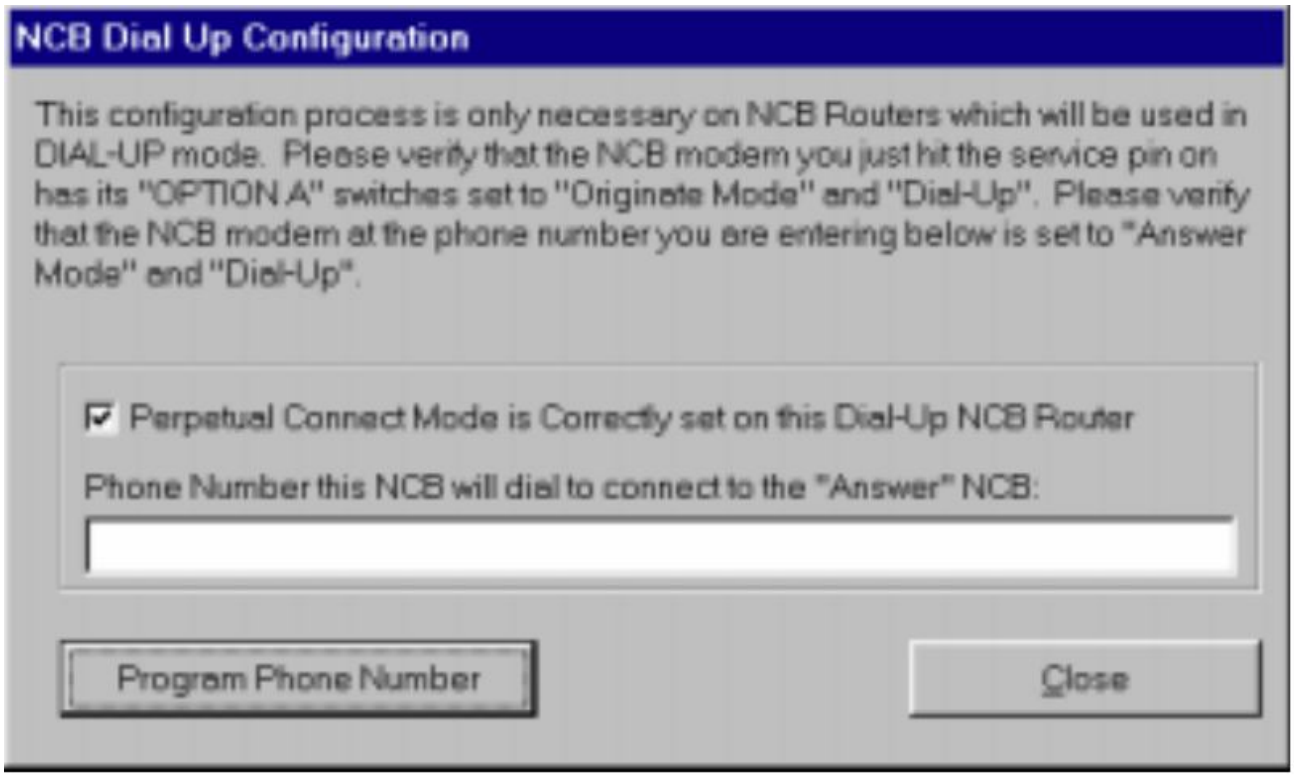
Before performing any configuration steps, be sure the routers have been installed and switch settings are correct for dial up mode operation.

1. Bind the first (originating) router to the server as normal; this is described in section 2.4 of the Local Area Server manual. The bind pin on the router is marked RSVC per the illustration above.
2. After the router is bound, select NCB Router Configuration from the Configure menu. This opens the dialog displayed below.



NCB Router Configuration Dialog

3. Click on Dial Up Setup.
4. When prompted, press the CSVC button on the originating router and hold it for approximately 3 seconds. This opens the NCB Dial Up Configuration dialog displayed on the next page.



Dial Up Mode Configuration Dialog

5. Enter the answering modem phone number in the field. Be sure to enter the complete dialing number.
6. Click on the Program Phone Number button. The following message should be displayed: “The NCB has been configured successfully.” In addition, the Perpetual Connect Mode checkbox should appear the NCB Dial Up Configuration dialog as in the illustration above.
7. After the modem side of the routers have been connected and configured (the operational LEDs are displayed as described below), bind the far router (answering) to the network in the same manner de-scribed in step one.

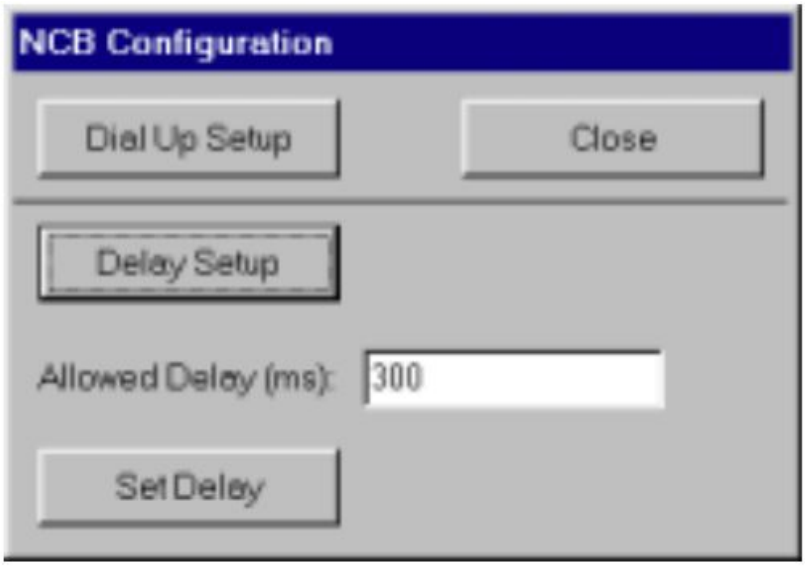
Operation Indicators

For normal operation, the PWR (Power), CD (Carrier Detect) and OH (OffHook) LEDs should be lit on both routers. After both NCBs are bound, the ACT should flash at least once a minute while the LAS is running to indicate normal network traffic.

NCB Router Delay Time

Routers of any type create delays of network traffic measured in milliseconds. These delays are calculated and accounted for by the Echelon network as they can be critical to network timing issues. However, by inserting a public telephone network into the Echelon network, it may be necessary to adjust the allowance for this delay time manually for the NCB routers. This is done by selecting NCB Router Configuration from the Configure menu and clicking on the Delay Setup button. This opens the NCB Configuration dialog as displayed below. A default value of 300 milliseconds is set as the delay time for NCB router communication. To adjust it, enter a new value in the field and click on the Set Delay button.

NOTE: The NCB router delay time should only be changed under the guidance of a factory technician. Do not change this setting without consulting factory technical support.



NCB Router Configuration Dialog - Delay Settings

NCB/IM Router Configuration for Router Versions 3.00 or Later
DIP switch settings for NCB/IM routers version 3.00 and later:

Switch # Function

1. Up: Modem in Answer Mode
   Dn: Modem in Originate Mode
2. Up: Modem Dial-Up Mode
   Dn: Modem Leased-Line Mode
3. Not Used, leave up
4. Not Used, leave up
5. Up: Enable setting of the control Neuron processor address. This must remain up.
6. Dn: Control Neuron processor subnet/node address = 255/1. This must remain down.
7. Up: -10 dBm Modem Tx Level (normal)
   Dn: -16 dBm Modem Tx Level (back-to-back leased-line connection)
8. Leased-Line Mode 2-wire/4-wire Select
   Up: 2-wire
   Dn: 4-wir
   NOTE: The Reset Pin on the NCB router must be pressed after making changes to the Switch settings.
   NOTE: Option A, switch 7 should only by placed in the down position for testing purposes where both routers are separated by only a few feet – for example on a test bench.

Option A DIP Switch Settings

Dial-Up:

Unit 1 (Originate): DU UU UD UU

Unit 2 (Answer): UU UU UD UU

D = Down U = Up

Leased-Line - 2-wire:

Unit 1 (Originate): DD UU UD UU

Unit 2 (Answer): UD UU UD UU

Leased-Line - 4-wire:

Unit 1 (Originate): DD UU UD UD

Unit 2 (Answer): UD UU UD UD

Handset Connection

A standard telephone handset may be connected to the AUDIO connector to allow use of the simultaneous voice/data feature of the NCB router. Audio directly from the telephone circuit is routed to this connector during modem dialing and training to permit monitoring of call establishment (as typical modems provide via an internal speaker). After training is completed (when the CD LED turns on), bidirectional audio from the simultaneous voice/data system is available at this connector. The audio on this connector is digitized and transferred across the modem link by utilizing a portion of the connection bandwidth. This utilization is dynamic and only consumes bandwidth when audio is detected into the AUDIO connector.

NOTE: Data throughput across the modem channel is decreased by 7200 bps when audio input is detected at either handset. To maximize data throughput, we recommend that handsets be normally left disconnected.

NCB Binding and Programming

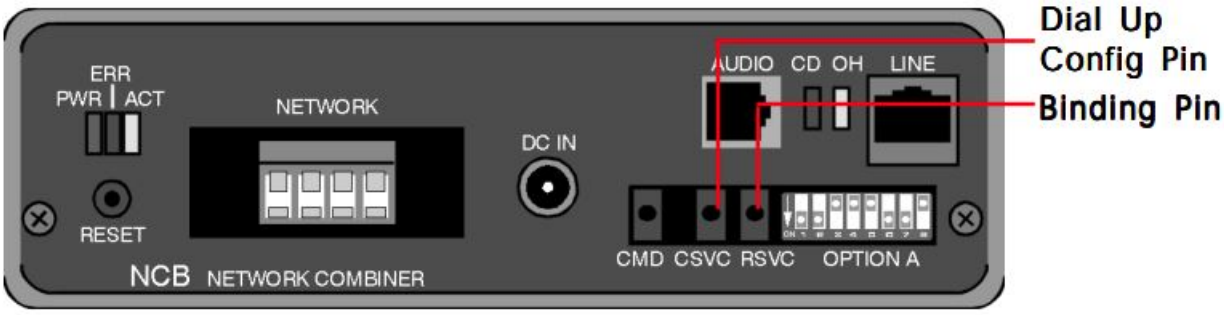
NCB routers must be added or inserted in the Echelon network like any standard router and bound using the same router inserting tools described in section 2.4 of the Local Area Server manual.
No modem programming is required for leased line or dry copper installations; however, for dial up operation, some configuration must done for the modems to communicate. A programming utility is included in the server which performs this function once all physical connections and switch settings have been done.
The following paragraphs explain the steps to bind and configure a pair of NCB routers.

Leased Line Modem Steps

Before performing any configuration steps, be sure the routers have been installed and switch settings are correct for leased line mode operation.

1. Bind the first (originating) router to the server as normal; this is described in section 2.4 of the Local Area Server manual. The bind pin on the router is marked RSVC per the illustration below.
2. After the modem side of the routers have been connected and configured, bind the far router (answering) to the network in the same manner described in step one.

   NOTE: All hardware setup information, including switch settings, wiring and mounting are contained in the Network Install manual in the Routers section.



NCB Router End Panel

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Dial Up Modem Steps

For NCB routers used on a dial up phone line two parameters must be configured for proper operation in the first (originating) router modem:

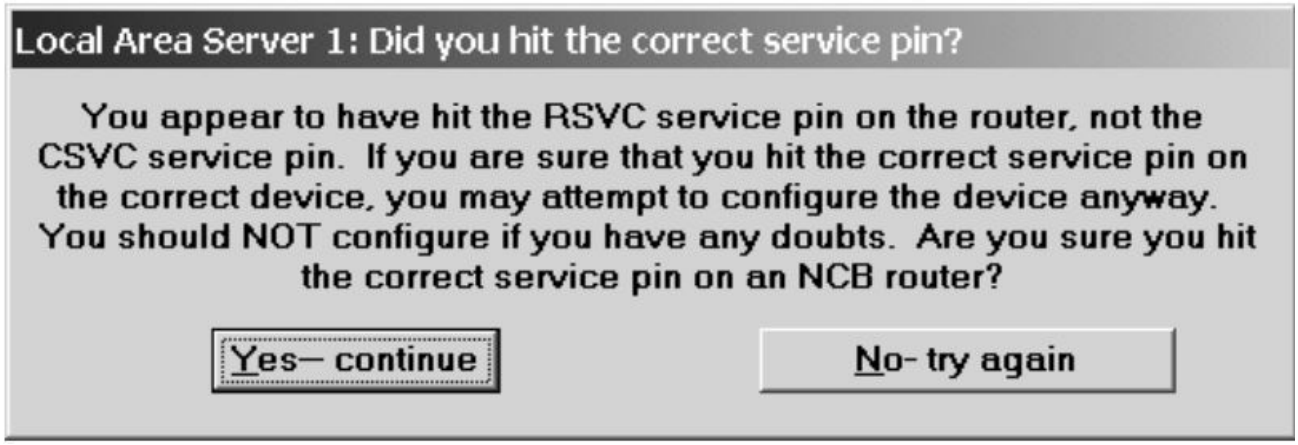
- A. Enter the complete phone number of the second (answering) NCB.
- B. Verify that Perpetual Connect Mode is active so that the originating router will always maintain and establish a connection with the answering NCB router.

Before performing any configuration steps, be sure the routers have been installed and switch settings are correct for dial up mode operation.

1. Bind the first (originating) router to the server as normal; this is described in section 2.4 of the Local Area Server manual. The bind pin on the router is marked RSVC per the illustration above.
2. After the router is bound, select NCB Router Configuration from the Configure menu. This opens the dialog displayed below.

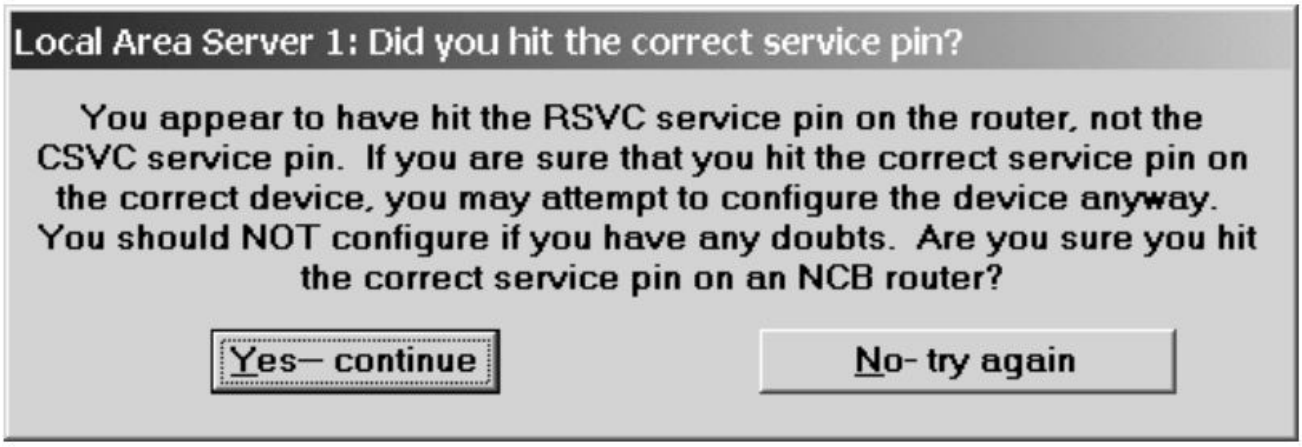
NCB Router Configuration Dialog

3. Click on Dial Up Setup.
4. When prompted, press the CSVC button on the originating router and hold it for approximately 3 seconds. This opens the NCB Dial Up Configuration dialog displayed on the next page.
   NOTE: If using a Local Area Server version 2.0 prior to service pack 4 with version 3.00 or later NCB/IM routers the following warning will appear:



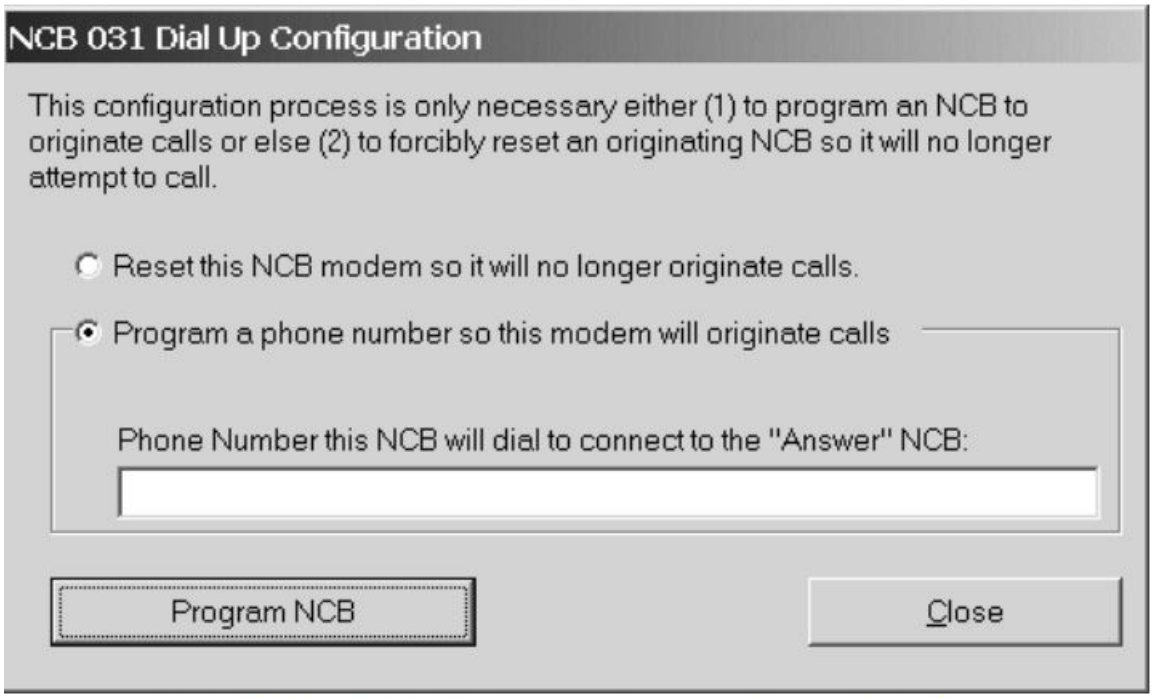
Click the Yes-continue button above to advance to the NCB Dialup Configuration.

NOTE: If using a Local Area Server version 2.1 prior to service pack 2 with version 3.00 or later NCB/IM routers the following warning will appear:



Click the Yes-continue button above to advance to the NCB Dialup Configuration.

5. Enter the answering modem phone number in the field. Be sure to enter the complete dialing number.
6. Click on the Program Phone Number button. The following message should be displayed: “The NCB has been configured successfully.” In addition, the Perpetual Connect Mode checkbox should appear the NCB Dial Up Configuration dialog as in the illustration above.
7. After the modem side of the routers have been connected and configured (the operational LEDs are displayed as described below), bind the far router (answering) to the network in the same manner described in step one.



Dial Up Mode Configuration Dialog

- After an NCB-IM has been bound into a Local Area Server and configured as an originator (with a phone number), it must remain an originating NCB-IM. This NCB-IM must never be used as an answering NCB-IM.
- After an NCB-IM has been bound into a Local Area Server and configured as an answering NCB-IM, it must always remain an answering NCB-IM.
- If you mistakenly swap an originating NCB-IM with an answering NCB-IM you must contact the factory for support or replacement units.

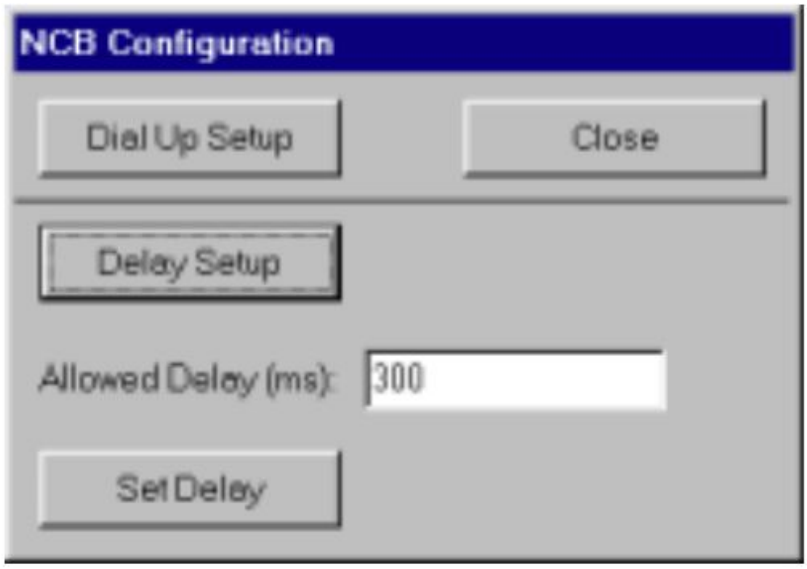
Operation Indicators

For normal operation, the PWR (Power), CD (Carrier Detect) and OH (OffHook) LEDs should be lit on both routers. After both NCBs are bound, the ACT should flash at least once a minute while the LAS is running to indicate normal network traffic.

NCB Router Delay Time

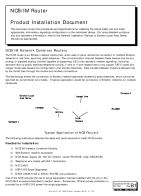
Routers of any type create delays of network traffic measured in milliseconds. These delays are calculated and accounted for by the Echelon network as they can be critical to network timing issues. However, by inserting a public telephone network into the Echelon network, it may be necessary to adjust the allowance for this delay time manually for the NCB routers. This is done by selecting NCB Router Configuration from the Configure menu and clicking on the Delay Setup button. This opens the NCB Configuration dialog as displayed below. A default value of 300 milliseconds is set as the delay time for NCB router communication. To adjust it, enter a new value in the field and click on the Set Delay button.

NOTE: The NCB router delay time should only be changed under the guidance of a factory technician. Do not change this setting without consulting factory technical support.



NCB Router Configuration Dialog - Delay Settings

Documents / Resources

	NOTIFIER NCB-IM Network Combiner Router [pdf] Instruction Manual NCB-IM Network Combiner Router, NCB-IM, Network Combiner Router, Combiner Router, Router

References

- Fire Alarm Resources | Download fire alarm documents