

## Chapter 15

# Configuring T3/E3 and T1/E1 Modules

This chapter describes how to configure the following T3/E3 and T1/E1 modules:

- CT3, CT1, CE1
- T3 (DS3), E3

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## Overview

E-series routers can route traffic, such as IP/Frame Relay, IP/PPP, or IP/ATM, on higher-speed uplink modules into the core of the Internet. T3/E3 and T1/E1 line modules pair with I/O modules to provide particular capabilities and connections.

For complete module details, see Table 46 and the *E-series Module Guide*.

**Table 46: T3/E3 and T1/E1 Line Modules and I/O Modules**

Line Module	I/O Module	Description	NMC-RX Software Reference Name
CE1	CE1 FULL	20-port E1 module that supports channelization to DS0	CE1-20 port
COCX-F3	CT3/T3 12	12-port unchannelized T3 module for frame operation	T3 FRAME-12 port
CT1	CT1 FULL	24-port E1 module that supports channelization to DS0	CT1-24 port
CT3	CT3/T3	3-port T3 module that supports channelization to T1 and DS0	CT3-3 port
CT3/T3-F0	CT3/T3 12	12-port T3 module that supports both channelized operation (T1 and DS0) and unchannelized T3 operation	CT3-12 port

**Table 46: T3/E3 and T1/E1 Line Modules and I/O Modules (continued)**

Line Module	I/O Module	Description	NMC-RX Software Reference Name
E3 ATM	E3	3-port unchannelized E3 module for ATM	E3 ATM-3 port
E3 FRAME	E3	3-port unchannelized E3 module for frame operation	E3 FRAME-3 port
OCx/STMx ATM	4xDS3 ATM	4-port unchannelized E3 module for ATM operation	T3 ATM-4 port
T3 ATM	CT3/T3	3-port unchannelized T3 module for ATM operation	T3 ATM-3 port
T3 FRAME	CT3/T3	3-port unchannelized T3 module for frame operation	T3 FRAME-3 port

The channelized and unchannelized modules described in this chapter are physically different; however, they are configured in similar ways.

## Configuration Tasks

Typically, you configure channelized or unchannelized modules in the following order. Some steps may not apply for a particular module.

1. Set the parameters that provide basic identification and status information about the module.
2. Set the line interface parameters.
3. Set the DS1 interface parameters.
4. Configure the DS0 bundle parameters. (See *Chapter 13, Configuring DS0 Bundles*.)
5. Configure the:
  - ATM interfaces (see *Chapter 17, Configuring ATM*)
  - Bridged IP/1483 interfaces (see *Chapter 19, Configuring Bridged IP*)
  - Cisco HDLC interfaces (see *Chapter 22, Configuring Cisco HDLC*)
  - Frame Relay interfaces (see *Chapter 23, Configuring Frame Relay*)
  - IP interfaces (see *NMC-RX User Guide, Vol. 2, Chapter 6, Configuring IP*)
  - MLPPP bundles (see *Chapter 24, Configuring MLPPP Bundles*)
  - PPP interfaces (see *Chapter 26, Configuring PPP*)
  - PPPoE interfaces (see *Chapter 27, Configuring PPP over Ethernet*)

## Configuring a Module

You can configure the admin status for a module only by enabling or disabling it.

To change the admin status:

1. In the Instance Explorer list, select the module that you want to configure.
2. Right-click, and select Configure.

The Module Config tab appears in the work area.

3. Select the admin status (Table 47).

**Table 47: Module Configuration Parameters**

Field	Description
Module Type	Module type (cannot edit)
Admin Status	<ul style="list-style-type: none"> <li>■ Enabled—Module is running</li> <li>■ Disabled—Module is not in operation</li> </ul>
Serial Number	Ten-digit identification number (S/N) on the face plate of the module. This value is automatically retrieved from the device, and you cannot edit it.
IOA Serial Number	Ten-digit identification number (S/N) on the face plate of the input/output adapter. This value is automatically retrieved from the device, and you cannot edit it.

4. Click Save.

## Configuring a Line Interface

You can configure line interfaces on CT3, T3, and E3 line modules. CT1 and CE1 line modules do not have line interfaces.

To configure a line interface:

1. In the Instance Explorer, select the line interface that you want to configure.
2. Right-click, and select Configure.

The Config tab appears in the work area.



**NOTE:** Fields vary depending on the type of CT3, T3, and E3 line module that you are configuring. (See the following examples and Table 48 on page 187.)

CT3 line module

E3 Frame line module

The screenshot shows the 'T3 Config' window with the following settings:

- Location: Physical: Module: T3 FRAME-3 port, Slot: 3, Port: 0
- Admin Status: Down
- Framing Type: M23
- Transmit Timing: Received Timing
- Loopback Mode: None
- Length(meters): 0
- DSU Settings: Mode: None, Bandwidth Limit: 0, Scramble Mode:
- HDLG Settings: CRC Checking Enabled: , Data Inversion: , CRC Algorithm: 16 Bit (selected), 32 Bit
- MTU: 1600, MRU: 1600

T3 Frame line module

3. Set the line interface parameters (Table 48).

**Table 48: CT3, T3, and E3 Module Parameters**

Parameter	Description	CT3	T3 ATM	T3 FRAME	E3 ATM	E3 FRAME
Admin Status	<ul style="list-style-type: none"> <li>■ Up—Interface is enabled by the administrator</li> <li>■ Down—Interface is disabled by the administrator</li> </ul>	X	X	X	X	X
Transmit Timing	Specifies the type of timing: <ul style="list-style-type: none"> <li>■ Local Timing—System receives its clocking from an internal source</li> <li>■ Module Timing—System receives its clocking from a network source</li> <li>■ Chassis Timing—System receives its clocking from the configured system clock</li> </ul>	X	X	X	X	X
Length (meters)	Specifies the cable length. The length of cable determines power requirements: <ul style="list-style-type: none"> <li>■ 0 to 224—Use for low-power output</li> <li>■ 225 to 450—Use for high-power output</li> </ul>	X	-	X	-	-
Framing Type	<ul style="list-style-type: none"> <li>■ M23—M23 multiplexer framing</li> <li>■ M23Plcp—M23 with PLCP framing</li> <li>■ C-Bit Parity—C-bit parity framing</li> <li>■ CbitParityPlcp—C-bit parity with PLCP framing</li> <li>■ G832—G.832 ATM direct mapping</li> <li>■ Framed—Framed mode</li> <li>■ PLCP—PLPC framing</li> </ul>	X	X	X	-	-
		-	X	-	-	-
		X	X	X	-	-
		-	X	-	-	-
		-	-	-	X	X
		-	-	-	X	X
		-	-	-	X	-

**Table 48: CT3, T3, and E3 Module Parameters (continued)**

Parameter	Description	CT3	T3 ATM	T3 FRAME	E3 ATM	E3 FRAME
Loopback Mode	<ul style="list-style-type: none"> <li>■ None—No loopback specified (default)</li> <li>■ Network Payload—Loops the data toward the network</li> <li>■ Network Line—Sets a local loopback at the payload controllers</li> <li>■ Local—Loops back outgoing data from the transmit to the receive side</li> </ul>	x	x	-	x	x
Cell Scramble	Enables cell scrambling on the interface	-	x	-	x	-
<b>DSU Settings</b>						
Mode	None, Larscom, Digital Link	-	-	x	-	-
Bandwidth Limit	Range: 0–44210	-	-	x	-	-
Scramble Mode	Enables cell scrambling on the interface	-	-	x	-	-
<b>HDLC Settings</b>						
CRC Checking Enabled	Enables cyclic redundancy check (CRC), an error-checking technique that uses a calculated numeric value to detect errors in transmitted data	-	-	x	-	x
CRC Algorithm	Cyclic redundancy check algorithm used during error checking (16 bit or 32 bit)	-	-	x	-	x
Data Inversion	Enables data stream inversion for the interface	-	-	x	-	x
MTU	Maximum transmission unit size for the interface. Coordinate this value with the network administrator on the other end of the line; default 1500	-	-	x	-	x
MRU	Maximum receive unit size for the interface. Coordinate this value with the network administrator on the other end of the line; default 1500	-	-	x	-	x
(x = parameter available on module)						

4. Click Save.

Your configuration settings are saved.

## Configuring a DS1 Interface

You can configure DS1 interfaces on CT3, CT1, and CE1 line modules.

- CT3 modules are made up of three DS3 line interfaces. Each DS3 line interface multiplexes 28 asynchronous T1 (DS1) channels.
- CT1 modules have 24 T1 channels
- CE1 modules have 20 E1 channels

To configure a DS1 interface:

1. In the Instance Explorer, navigate to the DS1 level.
2. Select the DS1 interface that you want to configure, right-click, and select Configure.

The DS1 Config tab appears in the work area.

3. Set the DS1 configuration parameters (Table 49).

**Table 49: DS1 Configuration Parameters**

Field	Description
Name	Identifier for the interface; generated automatically
Alias	Description of the interface; 0–15 characters; default: blank
IfIndex	Identifier for the interface on a particular line interface; generated automatically
Operational	Current operational status of the interface
Administrative	Desired status of the interface: Up/Down; default: Up
Framing Type	<ul style="list-style-type: none"> <li>■ ESF—T1 framing for extended superframes (ESF) (default)</li> <li>■ SF—T1 framing for superframes (SF)</li> <li>■ CRC4—Cyclic redundancy check (CE1 only)</li> <li>■ no CRC4—(CE1 only)</li> </ul>

**Table 49: DS1 Configuration Parameters (continued)**

Field	Description
Transmit Clock	<ul style="list-style-type: none"> <li>■ Received Timing—Sets the clock source on the active line</li> <li>■ Module Timing—Receives its clocking from a network source</li> <li>■ Chassis Timing—Receives its clocking from the configured system clock</li> </ul>
Operation Mode	Specifies the type of controller (DS1): <ul style="list-style-type: none"> <li>■ T1—T1 and CT3 modules only</li> <li>■ E1—E1 module only (Europe)</li> <li>■ J1—T1 module only; J1 variant of the T1 framing (Japan)</li> </ul>
Line Coding	<ul style="list-style-type: none"> <li>■ AMI—Specifies alternate mark inversion; default</li> <li>■ B8ZS—Specifies bipolar with eight-zero substitution; T1 and CT3 modules only</li> <li>■ HDB3—Specifies high-density bipolar 3 line-code type; E1 module only (Europe)</li> </ul>
Loopback Mode	<ul style="list-style-type: none"> <li>■ None—No loopback specified; default</li> <li>■ Network Payload—Loops the data toward the network</li> <li>■ Network Line—Sets a local loopback at the payload controllers</li> <li>■ Local—Loops back outgoing data from the transmit to the receive side</li> </ul>
DS0 Bundle Time Slots	<ul style="list-style-type: none"> <li>■ Time slots 1–24 (CT3 and CT1) or 1–31 (CE1)</li> <li>■ An X indicates preallocated DS0 bundle timeslots on the T1 line interface selected</li> </ul>
Allocated Bandwidth (kbps)	<ul style="list-style-type: none"> <li>■ Displays the total amount of allocated bandwidth</li> </ul>

4. Click Save.

You can now create DS0 interfaces on the DS1 interface. See *Chapter 13, Configuring DS0 Bundles*.