

# main-fiber port

To specify the port number to use for the optical link connection on the SDH/STM-1 trunk card on a Cisco AS5850, use the **main-fiber port** command in controller configuration mode.

**main-fiber port {0 | 1}**

Syntax Description	0	1
	Specifies use of port 0 as the optical link connection. This is the default.	Specifies use of port 1 as the optical link connection.

**Defaults** Port 0

**Command Modes** Controller configuration

Command History	Release	Modification
	12.2(15)T	This command was introduced.

**Usage Guidelines** Use the **main-fiber** controller configuration command if you need to use optical port 1 during installation of the SDH/STM-1 trunk card on a Cisco AS5850 or if you suspect some problem with optical port 0.

This command does not have a **no** form. To restore the default value, use the **main-fiber port 0** command.

**Examples** The following example selects port 1 as the port with the optical connection:

```
Router(config)# controller sonet 1/0
Router(config-controller)# main-fiber port 1
```

# mdl

To configure the Maintenance Data Link (MDL) message defined in the ANSI T1.107a-1990 specification, use the **mdl** command in controller configuration mode. To remove the message, use the **no** form of this command.

```
mdl { transmit { path | idle-signal | test-signal } | string { eic | lic | fic | unit | pfi | port | generator }
      string }
```

```
no mdl { transmit { path | idle-signal | test-signal } | string { eic | lic | fic | unit | pfi | port
      | generator } string }
```

## Syntax Description

<b>transmit path</b>	Enables transmission of the MDL Path message.
<b>transmit idle-signal</b>	Enables transmission of the MDL Idle Signal message.
<b>transmit test-signal</b>	Enables transmission of the MDL Test Signal message.
<b>string eic</b> <i>string</i>	Specifies the Equipment Identification Code; can be up to 10 characters.
<b>string lic</b> <i>string</i>	Specifies the Location Identification Code; can be up to 11 characters.
<b>string fic</b> <i>string</i>	Specifies the Frame Identification Code; can be up to 10 characters.
<b>string unit</b> <i>string</i>	Specifies the Unit Identification Code; can be up to 6 characters.
<b>string pfi</b> <i>string</i>	Specifies the Path Facility Identification Code sent in the MDL Path message; can be up to 38 characters.
<b>string port</b> <i>string</i>	Specifies the Port number string sent in the MDL Idle Signal message; can be up to 38 characters.
<b>string generator</b> <i>string</i>	Specifies the Generator number string sent in the MDL Test Signal message; can be up to 38 characters.

## Defaults

No MDL message is configured.

## Command Modes

Controller configuration

## Command History

Release	Modification
11.3	This command was introduced.
12.2(11)YT	This command was integrated into Cisco IOS Release 12.2(11)YT and implemented on the following platforms: Cisco 2650XM, Cisco 2651XM, Cisco 2691, Cisco 3660 series, Cisco 3725, and Cisco 3745 routers.
12.2(15)T	This command was integrated into Cisco IOS Release 12.2(15)T.

**Usage Guidelines**

Use the **show controllers t3** command to display MDL information (received strings). MDL information is displayed only when framing is set to C-bit.

**Note**

MDL is supported only when the DS3 framing is C-bit parity.

**Examples**

The following example shows the **mdl** commands on a T3 controller in slot 1, port 0:

```
Router(config)# controller t3 1/0
Router(config-controller)# clock source line
Router(config-controller)# mdl string eic ID
Router(config-controller)# mdl string fic Building B
Router(config-controller)# mdl string unit ABC
Router(config-controller)# mdl string pfi Facility Z
Router(config-controller)# mdl string port Port 7
Router(config-controller)# mdl transmit path
Router(config-controller)# mdl transmit idle-signal
```

**Related Commands**

Command	Description
<a href="#">show controllers t3</a>	Displays information about T3 controllers.

# media-type

To specify the physical connection on an interface, use the **media-type** command in interface configuration mode. To restore the default value, use the **no** form of this command.

**media-type** { **au**i | **10baset** | **100baset** | **mii** }

**no media-type** { **au**i | **10baset** | **100baset** | **mii** }

## Syntax Description

<b>au</b> i	Selects an AUI 15-pin physical connection. This is the default on Cisco 4000 series routers.
<b>10baset</b>	Selects an R-J45 10BASE-T physical connection.
<b>100baset</b>	Specifies an RJ-45 100BASE-T physical connection. This is the default on Cisco 7000 series and Cisco 7200 series routers.
<b>mii</b>	Specifies a media-independent interface.

## Defaults

An AUI 15-pin physical connection is the default setting on Cisco 4000 series routers. 100BASE-T physical connection is the default setting on Cisco 7000 series and Cisco 7200 series routers.

## Command Modes

Interface configuration

## Command History

Release	Modification
10.0	This command was introduced.

## Usage Guidelines

To specify the physical connection on an interface, use the following interface configuration:

- Ethernet network interface module configuration on Cisco 4000 series routers
- Fast Ethernet Interface Processor (FEIP) on Cisco 7000 series, 7200 series, and 7500 series routers
- Full-duplex or half-duplex mode on a serial interface

## Examples

The following example selects an RJ-45 10BASE-T physical connection on Ethernet interface 1:

```
Router(config)# interface ethernet 1
Router(config-if)# media-type 10baset
```

The following example specifies a media-independent interface physical connection to Fast Ethernet slot 0, port 1 on the Cisco 7000 or 7200 series:

```
Router(config)# interface fastethernet 0/1
Router(config-if)# media-type mii
```

The following example specifies a media-independent interface physical connection to Fast Ethernet slot 0, port adapter 1, port 1 on the Cisco 7500 series:

```
Router(config)# interface fastethernet 0/1/1  
Router(config-if)# media-type mi
```

# modem dtr-delay

To control the time that a data terminal ready (DTR) signal is held down when a line clears, use the **modem dtr-delay** command in line configuration mode. To restore the default hold down time, use the **no** form of this command.

**modem dtr-delay** *seconds*

**no modem dtr-delay** *seconds*

Syntax Description	<i>seconds</i>	Number of seconds. The default is 5.
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Defaults	The default DTR signal hold down time is 5 seconds.
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Command Modes	Line configuration
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Command History	Release	Modification
	12.1	This command was introduced.

Usage Guidelines	Use this command to reduce the time that a DTR signal is held down after an asynchronous line clears and before the DTR signal is raised again to accept new calls. Incoming calls may be rejected in heavily loaded systems even when modems are unused because the default DTR hold down interval may be too long. The <b>modem dtr-delay</b> command is designed for lines used for an unframed asynchronous session such as Telnet. Lines used for a framed asynchronous session such as PPP should use the <b>pulse-time</b> interface command.
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Examples	The following example shows how to specify a DTR hold down interval of 2 seconds:
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```
Router(config)# line 7
Router(config-line)# modem dtr-delay 2
```

Related Commands	Command	Description
	<b>pulse-time</b>	Enables pulsing DTR signal intervals on serial interfaces.

# mop enabled

To enable an interface to support the Maintenance Operation Protocol (MOP), use the **mop enabled** command in interface configuration mode. To disable MOP on an interface, use the **no** form of this command.

**mop enabled**

**no mop enabled**

## Syntax Description

This command has no arguments or keywords.

## Defaults

Enabled on Ethernet interfaces and disabled on all other interfaces.

## Command Modes

Interface configuration

## Command History

Release	Modification
10.0	This command was introduced.

## Examples

The following example enables MOP for serial interface 0:

```
Router(config)# interface serial 0
Router(config-if)# mop enable
```

## Related Commands

Command	Description
<b>mop retransmit-timer</b>	Configures the length of time that the Cisco IOS software waits before sending boot requests again to a MOP server.
<b>mop retries</b>	Configures the number of times the Cisco IOS software will send boot requests again to a MOP server.
<b>mop sysid</b>	Enables an interface to send out periodic MOP system identification messages.

# mop sysid

To enable an interface to send out periodic Maintenance Operation Protocol (MOP) system identification messages, use the **mop sysid** command in interface configuration mode. To disable MOP message support on an interface, use the **no** form of this command.

**mop sysid**

**no mop sysid**

**Syntax Description** This command has no arguments or keywords.

**Defaults** Enabled

**Command Modes** Interface configuration

Command History	Release	Modification
	10.0	This command was introduced.

**Usage Guidelines** You can still run MOP without having the background system ID messages sent. This command lets you use the MOP remote console, but does not generate messages used by the configurator.

**Examples** The following example enables serial interface 0 to send MOP system identification messages:

```
Router(config)# interface serial 0
Router(config-if)# mop sysid
```

Related Commands	Command	Description
	<b>mop device-code</b>	Identifies the type of device sending MOP sysid messages and request program messages.
	<b>mop enabled</b>	Enables an interface to support the MOP.

# mtu

To adjust the maximum packet size or maximum transmission unit (MTU) size, use the **mtu** command in interface configuration mode. To restore the MTU value to its original default value, use the **no** form of this command.

**mtu** *bytes*

**no mtu**

## Syntax Description

*bytes* Desired size in bytes.

## Defaults

Table 9 lists default MTU values according to media type.

**Table 9** Default Media MTU Values

Media Type	Default MTU (Bytes)
Ethernet	1500
Serial	1500
Token Ring	4464
ATM	4470
FDDI	4470
HSSI (HSA)	4470

## Command Modes

Interface configuration

## Command History

Release	Modification
10.0	This command was introduced.

## Usage Guidelines

Each interface has a default maximum packet size or MTU size. This number generally defaults to the largest size possible for that interface type. On serial interfaces, the MTU size varies, but cannot be set smaller than 64 bytes.



### Caution

Changing an MTU size on a Cisco 7500 series router results in the recarving of buffers and resetting of all interfaces. The following message is displayed:

```
%RSP-3-Restart:cbus complex.
```

### Protocol-Specific Versions of mtu Command

Changing the MTU value with the **mtu** interface configuration command can affect values for the protocol-specific versions of the command (the **ip mtu** command, for example). If the value specified with the **ip mtu** interface configuration command is the same as the value specified with the **mtu** interface configuration command, and you change the value for the **mtu** interface configuration command, the **ip mtu** value automatically matches the new **mtu** interface configuration command value. However, changing the values for the **ip mtu** configuration commands has no effect on the value for the **mtu** interface configuration command.

### ATM and LANE Interfaces

ATM interfaces are not bound by what is configured on the major interface. By default, MTU on a subinterface is equal to the default MTU (4490); if a client is configured the default is 1500. MTU can be changed on subinterfaces, but it may result in recarving of buffers to accommodate the new maximum MTU on the interface.

### Examples

The following example specifies an MTU of 1000 bytes:

```
Router(config)# interface serial 1
Router(config-if)# mtu 1000
```

### Related Commands

Command	Description
<a href="#">encapsulation smds</a>	Enables SMDS service on the desired interface.
<a href="#">ip mtu</a>	Sets the MTU size of IP packets sent on an interface.

# national bit (controller)

To set the E3 national bit in the G.751 frame used by the E3 controller, use the **national bit** command in controller configuration mode. To return to the default E3 controller national bit, use the **no** form of this command.

**national bit {0 | 1}**

**no national bit**

Syntax Description	0	Sets the E3 national bit in the G.751 frame to 0.
	1	Sets the E3 national bit in the G.751 frame to 1. This is the default.

**Defaults** The default value is 1.

**Command Modes** Controller configuration

Command History	Release	Modification
	11.1 CA	This command was introduced.
	12.2(11)YT	This command was integrated into Cisco IOS Release 12.2(11)YT and implemented on the following platforms: Cisco 2650XM, Cisco 2651XM, Cisco 2691, Cisco 3660 series, Cisco 3725, and Cisco 3745 routers.
	12.2(15)T	This command was integrated into Cisco IOS Release 12.2(15)T.

**Usage Guidelines** When G.751 framing is used, bit 11 of the G.751 frame is reserved for national use and is set to 1 by default.

Configure national bit 1 only when required for interoperability with your telephone company.

To verify the national bit configured on the interface, use the **show controllers serial EXEC** command.

**Examples** The following example sets the national bit to 1 on an E3 controller in slot 1, port 0:

```
Router(config)# controller e3 1/0
Router(config-controller)# national bit 1
```

**Related Commands** [show controllers serial](#) Displays information that is specific to the interface hardware.

# national bit (interface)

To set the E3 national bit in the G.751 frame used by the PA-E3 port adapter, use the **national bit** command in interface configuration mode. To return to the default E3 interface national bit, use the **no** form of this command.

**national bit {0 | 1}**

**no national bit**

Syntax Description	0	Sets the E3 national bit in the G.751 frame to 0. This is the default
	1	Sets the E3 national bit in the G.751 frame to 1.

**Defaults** The default value is 0.

**Command Modes** Interface configuration

Command History	Release	Modification
	11.1 CA	This command was introduced.

**Usage Guidelines** The **national bit** command sets bit 12 in the E3 frame.  
To verify the national bit configured on the interface, use the **show controllers serial EXEC** command.

**Examples** The following example sets the national bit to 1 on the PA-E3 port adapter in slot 1, port adapter slot 0, interface 0:

```
Router(config)# interface serial 1/0/0
Router(config-if)# national bit 1
```

Related Commands	Command	Description
	<a href="#">international bit</a>	Sets the E3 international bit in the G.751 frame used by the PA-E3 port adapter.
	<a href="#">show controllers serial</a>	Displays information that is specific to the interface hardware.

# national reserve

To set the E1 national bit, use the **national reserve** command in interface configuration mode. To return to the default E1 national bit, use the **no** form of this command.

**national reserve** {0 | 1}{0 | 1}{0 | 1}{0 | 1}{0 | 1}{0 | 1}

**no national reserve**

Syntax Description	0	1
	Sets any of the six required E1 national bits in the G.751 frame to 0.	Sets any of the six required E1 national bits in the G.751 frame to 1. This is the default.

**Defaults** 111111

**Command Modes** Interface configuration

Command History	Release	Modification
	12.0(5)XE	This command was introduced.
	12.0(7)XE1	Support for Cisco 7100 series routers was added.
	12.1(5)T	This command was integrated into Cisco IOS Release 12.1(5)T.

**Usage Guidelines** This command applies only for E1. This command not only sets the national reserve bits but also sets the international bit as well. The far left digit represents the international bit. All six digits must be present for the pattern to be valid.

**Examples** On Cisco 7100 series routers, the following example sets the E1 national bit on interface 1 on the port adapter in slot 0 to no scrambling:

```
Router(config)# interface atm 1/0
Router(config-if)# national reserve 011011
```

# negotiation

To configure speed, duplex, and flow control on the Gigabit Ethernet port of the Cisco 7200-I/O-GE+E, use the **negotiation** command in interface configuration mode. To disable automatic negotiation, use the **no negotiation auto** command.

**negotiation { forced | auto }**

**no negotiation auto**

## Syntax Description

<b>forced</b>	Disables flow control and configures the Gigabit Ethernet interface in 1000/full-duplex mode.
<b>auto</b>	Enables the autonegotiation protocol to configures the speed, duplex, and automatic flow-control of the Gigabit Ethernet interface.

## Defaults

Negotiation auto

## Command Modes

Interface configuration

## Command History

Release	Modification
11.1 CC	This command was introduced.
12.0(7)S, 12.0(6)T	The <b>forced</b> keyword was added.
12.1(3a)E	Support for the Cisco 7200-I/O-GE+E controller was introduced.
12.1(5)T	This command was integrated into Cisco IOS Release 12.1(5)T.

## Usage Guidelines

The **negotiation** command is applicable only to the Gigabit Ethernet interface of the Cisco 7200-I/O-GE+E. The **negotiation auto** command is used instead of the **duplex** and **speed** commands (which are used on Ethernet and Fast Ethernet interfaces) to automatically configure the duplex and speed settings of the interfaces. The **negotiation forced** command is used to configure the Gigabit Ethernet interface to be 1000/full-duplex only and to disable flow control. The Gigabit Ethernet interface of the Cisco 7200-I/O-GE+E is restricted to 1000 Mbps/full duplex only. Autonegotiation negotiates only to these values.

## Examples

The following example configures the Gigabit Ethernet interface of the Cisco 7200-I/O-GE +E to autonegotiate:

```
Router(config)# interface gigabitethernet 0/0
Router(config-if)# negotiation auto
```

## Related Commands

Command	Description
<a href="#">show interfaces gigabitethernet</a>	Checks the status and configuration settings of the Gigabit Ethernet interface of the Cisco 7200-I/O-GE+E.

# nrzi-encoding

To enable nonreturn-to-zero inverted (NRZI) line-coding format, use the **nrzi-encoding** command in interface configuration mode. To disable this capability, use the **no** form of this command.

**nrzi-encoding [mark]**

**no nrzi-encoding**

Syntax Description	mark	(Optional) Specifies that NRZI mark encoding is required on the PA-8T and PA-4T+ synchronous serial port adapters on Cisco 7200 and 7500 series routers. If mark is not specified, NRZI space encoding is used.
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Defaults	Disabled
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Command Modes	Interface configuration
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Command History	Release	Modification
	10.0	This command was introduced.
	11.3	The <b>mark</b> keyword was added for the Cisco 7200 series routers and Cisco 7500 series routers.

Usage Guidelines	All FSIP, PA-8T, and PA-4T+ interface types support nonreturn-to-zero (NRZ) and NRZI format. This is a line-coding format that is required for serial connections in some environments. NRZ encoding is most common. NRZI encoding is used primarily with EIA/TIA-232 connections in IBM environments.
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Examples	The following example configures serial interface 1 for NRZI encoding:
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```
Router(config)# interface serial 1
Router(config-if)# nrzi-encoding
```

The following example configures serial interface 3/1/0 for NRZI mark encoding:

```
Router(config)# interface serial 3/1/0
Router(config-if)# nrzi-encoding mark
```

# overhead j0

To specify the Regenerator Section (RS) Trace identifier (J0), use the **overhead j0** command in controller configuration mode. To restore the default value, use the **no** form of this command.

**overhead j0** {**transmit** | **receive**} *string*

**no overhead j0** {**transmit** | **receive**} *string*

Syntax Description	transmit	Specifies that the <i>string</i> argument is sent on the transmit line.
	receive	Specifies that the configured <i>string</i> argument is matched with the string received from a peer.
	<i>string</i>	Value in the range from 0 to 255 that is converted into character format and embedded in a 16-byte frame. The default is 1.

**Defaults** The default value is 1, and no peer authentication is performed.

**Command Modes** Controller configuration

Command History	Release	Modification
	12.0(17)S	This command was introduced.
	12.2(15)T	This command was integrated into Cisco IOS Release 12.2(15)T, and the <b>transmit</b> and <b>receive</b> keywords were added.

**Usage Guidelines** RS trace is a maintenance feature of SONET. One byte (J0) of the Section overhead associated with each SONET frame is used to carry information identifying the transmitting equipment.

Use this command for peer authentication and continuity testing between two STM-1 optical peers. If the authentication string sent by the originating peer does not match the configured string on the receiving peer, the SONET controller will not come up on the receiving peer. Alarm logs on the originating peer will show that it has RS-Trace Identifier Mismatch (RS-TIM).

**Examples** The following example shows how to configure J0 overhead in both the transmit and receive directions on a STM-1 trunk card:

```
Router(config)# controller sonet 2/0
Router(config-controller)# overhead j0 transmit 22
Router(config-controller)# overhead j0 receive 34
```

The following example shows how to set the RS Trace identifier to 82:

```
Router(config-controller)# overhead j0 transmit 82
```

# overhead j1

To configure the message length and the message text of the High Order Path Trace identifier (J1), use the **overhead j1** command in controller configuration or path configuration mode. To restore the default value, use the **no** form of this command.

```
overhead j1 length {16 | 64} {transmit-message | receive-message} string
```

```
no overhead j1 length {16 | 64} {transmit-message | receive-message} string
```

## Syntax Description

<b>length</b>	Specifies the length of the authentication <i>string</i> argument.
<b>16</b>	Specifies that the length of the authentication <i>string</i> is 16 characters. The STM-1 trunk card supports a string length of 16.
<b>64</b>	Specifies that the length of the authentication <i>string</i> is 64 characters.
<b>transmit-message</b>	Specifies that the <i>string</i> argument is sent on the transmit line.
<b>receive-message</b>	Specifies that the configured <i>string</i> argument is matched with the string received from a peer.
<i>string</i>	Combination of characters and numbers for the specified <b>length</b> value.

## Defaults

The default message length is 16 for SDH framing and 64 for SONET framing. No peer authentication is performed.

## Command Modes

### SDH Framing with AU-4 Mapping

Controller configuration

### SDH Framing with AU-3 Mapping, or SONET Framing

Path configuration

## Command History

Release	Modification
12.0(17)S	This command was introduced.
12.2(15)T	This command was integrated into Cisco IOS Release 12.2(15)T, and the <b>transmit-message</b> and <b>receive-message</b> keywords were added.

## Usage Guidelines

Path trace is a maintenance feature of SONET/SDH. One byte (J1) of the Path overhead associated with each path in the SONET/SDH frame is used to carry information identifying the originating Path Terminating Equipment (PTE).

Where you configure the Path Trace identifier depends on the framing (SDH or SONET) and the AUG mapping. In SDH with AU-4 mapping, the Path Trace identifier is configured at the SONET controller level. In SDH with AU-3 mapping or in SONET framing, the Path Trace identifier is configured at the path level.

In accordance with SONET and SDH standard requirements, the Path Trace message you enter is manipulated as follows:

- If you select a message length of 16, the actual message length can be up to 15 characters. An additional byte, prepended to the message, contains the result of a CRC7 calculated on the message. If the actual message text is fewer than 15 characters, the message text is padded to its full length with NULL characters.
- If you select a message length of 64 and the actual message text is fewer than 62 characters, the message text is padded with NULL characters. The last two byte positions, 63 and 64, are always CR/LF (0x0D/0x0A).

Use this command for peer authentication and continuity testing between two STM-1 optical peers. If the authentication string sent by the originating peer does not match the configured string on the receiving peer, the Path (and all E1 controllers within the path) will not come up on the receiving peer. Alarm logs on the originating peer will show that it has High Order Path-Trace Identifier Mismatch (HP-TIM).

## Examples

The following example shows J1 configuration in SDH framing with AU-4 AUG mapping. The **overhead j1** command sets the message length to 16, and specifies the message text as metro\_SF:

```
Router(config-controller)# au-4 1
Router(config-ctrlr-au4)# overhead j1 length 16 transmit-message metro_SF
```

The following example shows J1 configuration in SDH framing with AU-3 AUG mapping. The **overhead j1** command sets the message length to 16, and specifies the message text as metro\_LA:

```
Router(config)# controller sonet 4/0
Router(config-controller)# au-3 3
Router(config-ctrlr-au3)# overhead j1 length 16 receive-message metro_L
```

The following example shows J1 configuration in SONET framing in STS-1 mode. The **overhead j1** command sets the message length to 64, and specifies the message text:

```
Router(config)# controller sonet 4/0
Router(config-controller)# sts-1 3
Router(config-ctrlr-sts1)# overhead j1 length 64 transmit-message metro_washington
gsr_0057/4/3
```

The following example shows how to configure j1 overhead in both the transmit and receive directions:

```
Router(config)# controller sonet 2/0
Router(config-controller)# overhead j1 length 2 transmit-message 22
Router(config-controller)# overhead j1 length 2 receive-message 34
```

# physical-layer

To specify the mode of a slow-speed serial interface on a router as either synchronous or asynchronous, use the **physical-layer** command in interface configuration mode. To return the interface to the default mode of synchronous, use the **no** form of this command.

**physical-layer** {sync | async}

**no physical-layer**

## Syntax Description

<b>sync</b>	Places the interface in synchronous mode. This is the default.
<b>async</b>	Places the interface in asynchronous mode.

## Defaults

Synchronous mode

## Command Modes

Interface configuration

## Command History

Release	Modification
11.2	This command was introduced.

## Usage Guidelines

This command applies only to low-speed serial interfaces available on Cisco 2520 through 2523 series routers.

In synchronous mode, low-speed serial interfaces support all interface configuration commands available for high-speed serial interfaces, except the following two commands:

- **half-duplex timer cts-delay**
- **half-duplex timer rts-timeout**

When placed in asynchronous mode, low-speed serial interfaces support all commands available for standard asynchronous interfaces.

When you enter this command, it does not appear in the output of **more system:running-config** and **more nvram:startup-config** commands because the command is a physical-layer command.

## Examples

This example changes a low-speed serial interface from synchronous to asynchronous mode:

```
Router(config)# interface serial 2
Router(config-if)# physical-layer async
```

## Related Commands

Command	Description
<b>more</b>	Displays a specified file.

## port (interface)

To enable an interface on a PA-4R-DTR port adapter to operate as a concentrator port, use the **port** command in interface configuration mode. To restore the default station mode, use the **no** form of this command.

**port**

**no port**

---

**Syntax Description** This command has no arguments or keywords.

---

**Defaults** Station mode

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**Command Modes** Interface configuration

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**Command History**

Release	Modification
11.3(3)T	This command was introduced.

---

**Usage Guidelines**

By default, the interfaces of the PA-4R-DTR operate as Token Ring stations. Station mode is the typical operating mode. Use this command to enable an interface to operate as a concentrator port.

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**Examples**

The following example configures the PA-4R-DTR ports to operate in concentrator mode on a Cisco 7000 series router:

```
Router(config)# interface tokenring 3/0/0
Router(config-if)# port
```

# pos ais-shut

To send the line alarm indication signal (LAIS) when the Packet-Over-SONET (POS) interface is placed in any administrative shutdown state, use the **pos ais-shut** command in interface configuration mode.

## pos ais-shut

---

**Syntax Description** This command has no keywords or arguments.

---

**Defaults** No LAIS is sent.

---

**Command Modes** Interface configuration

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Command History	Release	Modification
	11.1 CC	This command was introduced.

---

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**Usage Guidelines** In Automatic Protection Switching (APS) environments, LAIS can be used to force a protection switch. This command forces an APS switch when the interface is placed in the administrative shutdown state. For more information on APS, refer to the “Configuring Serial Interfaces” chapter in the *Cisco IOS Interface Configuration Guide*.

This command does not have a **no** form.

---

**Examples** The following example forces the alarm indication on POS OC-3 interface 0 in slot 3:

```
Router(config)# interface pos 3/0
Router(config-if)# shutdown
Router(config-if)# pos ais-shut
```

# pos flag

To set the SONET overhead bytes in the frame header to meet a specific standards requirement or to ensure interoperability with the equipment of another vendor, use the **pos flag** command in interface configuration mode. To remove the setting of the SONET overhead bytes, use the **no** form of this command.

**pos flag** { **c2** | **j0** | **s1s0** } *value*

**no pos flag** { **c2** | **j0** | **s1s0** } *value*

Syntax Description		
<b>c2</b> <i>value</i>		Path signal identifier used to identify the payload content type. The default value is 0xCF.
<b>j0</b> <i>value</i>		Section trace byte (formerly the C1 byte). For interoperability with Synchronous Digital Hierarchy (SDH) equipment in Japan, use the value 0x1. The byte value can be 0 to 255.
<b>s1s0</b> <i>value</i>		S1 and S0 bits (bits 5 and 6 of the H1 #1 payload pointer byte). Use the following values to tell the SONET transmission equipment the SS bit: <ul style="list-style-type: none"> <li>For OC-3c, use 0 (this is the default).</li> <li>For AU-4 container in SDH, use 2.</li> </ul> The S1 and S0 bits can be 0 to 3. Values 1 and 3 are undefined. The default value is 0.

**Defaults** The default **c2** value is 0xCF, and the default **s1s0** value is 0.

**Command Modes** Interface configuration

Command History	Release	Modification
	11.2 GS	This command was introduced to support the Cisco 12000 series Gigabit Switch Routers.

**Usage Guidelines** Use the following values to tell the SONET transmission equipment the payload type:

- For PPP, or High-Level Data Link Control (HDLC) when required, use 0xCF (this is the default).
- For ATM, use 0x13.
- For other equipment, use any nonzero value.
- The byte value can be 0 to 255.

---

**Examples**

The following example sets the path signal identifier used to identify the payload content type to ATM on the **pos** interface in slot 9:

```
Router(config)# interface pos 9/0  
Router(config-if)# pos flag c2 0x13  
Router(config-if)# end  
Router#
```

# pos framing

To specify the framing used on the POS (Packet-over-SONET) interface, use the **pos framing** command in interface configuration mode. To return to the default SONET STS-3c framing mode, use the **no** form of this command.

```
pos framing {sdh | sonet}
```

```
no pos framing
```

## Syntax Description

<b>sdh</b>	Selects SDH STM-1 framing. This framing mode is typically used in Europe.
<b>sonet</b>	Selects SONET STS-3c framing. This is the default.

## Defaults

SONET STS-3c framing

## Command Modes

Interface configuration

## Command History

Release	Modification
11.2	This command was introduced.
11.3	This command was modified to change the <b>posi framing-sdh</b> command to <b>pos framing-sdh</b> .
11.2 GS	The command syntax was changed from <b>pos framing-sdh</b> to <b>pos framing</b> . The <b>sonet</b> keyword was added.

## Examples

The following example configures the interface for SDH STM-1 framing:

```
Router(config)# interface pos 3/0
Router(config-if)# pos framing sdh
Router(config-if)# no shutdown
```

## Related Commands

Command	Description
<a href="#">clock source (interface)</a>	Controls the clock used by a G.703-E1 interface.
<a href="#">interface</a>	Defines the IP addresses of the server, configures an interface type, and enters interface configuration mode.

# pos report

To permit selected SONET alarms to be logged to the console for a POS (Packet-Over-SONET) interface, use the **pos report** command in interface configuration mode. To disable logging of select SONET alarms, use the **no** form of this command.

```
pos report {b1-tca | b2-tca | b3-tca | lais | lrdi | pais | plop | prdi | rdool | sd-ber | sf-ber | slof | slos}
```

```
no pos report {b1-tca | b2-tca | b3-tca | lais | lrdi | pais | plop | prdi | rdool | sd-ber | sf-ber | slof | slos}
```

## Syntax Description

<b>b1-tca</b>	Reports B1 bit-error rate (BER) threshold crossing alarm (TCA) errors.
<b>b2-tca</b>	Reports B2 BER crossing TCA errors.
<b>b3-tca</b>	Reports B3 BER crossing TCA errors.
<b>lais</b>	Reports line alarm indication signal errors.
<b>lrdi</b>	Reports line remote defect indication errors.
<b>pais</b>	Reports path alarm indication signal errors.
<b>plop</b>	Reports path loss of pointer errors.
<b>prdi</b>	Reports path remote defect indication errors.
<b>rdool</b>	Reports receive data out of lock errors.
<b>sd-ber</b>	Reports signal degradation BER errors.
<b>sf-ber</b>	Reports signal failure BER errors.
<b>slof</b>	Reports section loss of frame errors.
<b>slos</b>	Reports section loss of signal errors.

## Defaults

The following alarms are reported by default:

- **b1-tca**
- **b2-tca**
- **b3-tca**
- **plop**
- **sf-ber**
- **slof**
- **slos**

## Command Modes

Interface configuration

## Command History

Release	Modification
11.1 CC	This command was introduced.

### Usage Guidelines

Reporting an alarm means that the alarm can be logged to the console. Just because an alarm is permitted to be logged does not guarantee that it is logged. SONET alarm hierarchy rules dictate that only the most severe alarm of an alarm group is reported. Whether an alarm is reported or not, you can view the current state of a defect by checking the “Active Defects” line from the **show controllers pos** command output. A defect is a problem indication that is a candidate for an alarm.

For B1, the bit interleaved parity error report is calculated by comparing the BIP-8 code with the BIP-8 code extracted from the B1 byte of the following frame. Differences indicate that section level bit errors have occurred.

For B2, the bit interleaved parity error report is calculated by comparing the BIP-8/24 code with the BIP-8 code extracted from the B2 byte of the following frame. Differences indicate that line level bit errors have occurred.

For B3, the bit interleaved parity error report is calculated by comparing the BIP-8 code with the BIP-8 code extracted from the B3 byte of the following frame. Differences indicate that path level bit errors have occurred.

PAIS is sent by line terminating equipment (LTE) to alert the downstream path terminating equipment (PTE) that it has detected a defect on its incoming line signal.

PLOP is reported as a result of an invalid pointer (H1, H2) or an excess number of new data flag (NDF) enabled indications.

SLOF is detected when a severely error framing (SEF) defect on the incoming SONET signal persists for 3 milliseconds.

SLOS is detected when an all-zeros pattern on the incoming SONET signal lasts 19 plus or minus 3 microseconds or longer. This defect might also be reported if the received signal level drops below the specified threshold.

To determine the alarms that are reported on the interface, use the **show controllers pos** command.

### Examples

The following example enables reporting of SD-BER and LAIS alarms on the interface:

```
Router(config)# interface pos 3/0/0
Router(config-if)# pos report sd-ber
Router(config-if)# pos report lais
Router(config-if)# end
Router#
```

### Related Commands

Command	Description
<a href="#">interface</a>	Defines the IP addresses of the server, configures an interface type, and enters interface configuration mode.
<a href="#">show controllers pos</a>	Displays information about the POS controllers.

# pos scramble-atm

To enable SONET payload scrambling on a POS (Packet-Over-SONET) interface, use the **pos scramble-atm** command in interface configuration mode. To disable scrambling, use the **no** form of this command.

**pos scramble-atm**

**no pos scramble-atm**

## Syntax Description

This command has no arguments or keywords.

## Defaults

Scrambling is disabled.

## Command Modes

Interface configuration

## Command History

Release	Modification
11.1 CA	This command was introduced.

## Usage Guidelines

SONET payload scrambling applies a self-synchronous scrambler ( $x^{43}+1$ ) to the Synchronous Payload Envelope (SPE) of the interface to ensure sufficient bit transition density. Both ends of the connection must use the same scrambling algorithm. When enabling POS scrambling on a VIP2 POSIP on the Cisco 7500 series router that has a hardware revision of 1.5 or higher, you can specify CRC 16 only (that is, CRC 32 is currently not supported).

To determine the hardware revision of the POSIP, use the **show diag** command.

To determine whether scrambling is enabled on the interface, use the **show interface pos** command or the **more nvram:startup-config** command.



### Note

SONET payload scrambling is enabled with the **pos scramble-atm** command. SONET payload scrambling applies a self-synchronous scrambler ( $x^{43}+1$ ) to the Synchronous Payload Envelope (SPE) of the interface to ensure sufficient bit transition density. Both sides of the connection must be configured using the **pos scramble-atm** command. Currently, when connecting to a Cisco 7500 series router and using the **pos scramble-atm** command, you must specify the **crc 16** command rather than the **crc 32** command.

## Examples

The following example enables scrambling on the interface:

```
Router(config)# interface pos 3/0
Router(config-if)# pos scramble-atm
Router(config-if)# no shutdown
Router(config-if)# end
Router#
```

Related Commands	Command	Description
	<a href="#">crc</a>	Sets the length of the CRC on an FSIP or HIP of the Cisco 7500 series routers or on a 4-port serial adapter of the Cisco 7200 series routers.
	<a href="#">interface</a>	Defines the IP addresses of the server, configures an interface type, and enters interface configuration mode.
	<a href="#">more</a>	Displays a specified file.
	<a href="#">show diag</a>	Displays hardware information for the router
	<a href="#">show interfaces pos</a>	Displays information about the Packet OC-3 interface in Cisco 7500 series routers.

# pos threshold

To set the bit-error rate (BER) threshold values of the specified alarms for a POS (Packet-Over-SONET) interface, use the **pos threshold** command in interface configuration mode. To return to the default setting, use the **no** form of this command.

```
pos threshold {b1-tca | b2-tca | b3-tca | sd-ber | sf-ber} rate
```

```
no pos threshold {b1-tca | b2-tca | b3-tca | sd-ber | sf-ber} rate
```

## Syntax Description

<b>b1-tca</b>	B1 BER threshold crossing alarm. The default is 6.
<b>b2-tca</b>	B2 BER threshold crossing alarm. The default is 6.
<b>b3-tca</b>	B3 BER threshold crossing alarm. The default is 6.
<b>sd-ber</b>	Signal degrade BER threshold. The default is 6.
<b>sf-ber</b>	Signal failure BER threshold. The default is 3 (10e-3).
<i>rate</i>	Bit-error rate from 3 to 9 (10-n).

## Defaults

The default *rate* is 6 for **b1-tca**, **b2-tca**, **b3-tca**, and **sd-ber**.

The default *rate* is 3 (10e-3) for **sf-ber**.

## Command Modes

Interface configuration

## Command History

Release	Modification
11.1 CC	This command was introduced.

## Usage Guidelines

For B1, the bit interleaved parity error report is calculated by comparing the BIP-8 code with the BIP-8 code extracted from the B1 byte of the following frame. Differences indicate that section level bit errors have occurred.

For B2, the bit interleaved parity error report is calculated by comparing the BIP-8/24 code with the BIP-8 code extracted from the B2 byte of the following frame. Differences indicate that line level bit errors have occurred.

For B3, the bit interleaved parity error report is calculated by comparing the BIP-8 code with the BIP-8 code extracted from the B3 byte of the following frame. Differences indicate that path level bit errors have occurred.

SF-BER and SD-BER are sourced from B2 BIP-8 error counts (as is B2-TCA). However, SF-BER and SD-BER feed into the automatic protection switching (APS) machine and can lead to a protection switch (if APS is configured).

B1-TCA, B2-TCA, and B3-TCA do nothing more than print a log message to the console (if reports for them are enabled).

To determine the BER thresholds configured on the interface, use the **show controllers pos** command.

**Examples**

The following example configures thresholds on the interface:

```
Router(config)# interface pos 3/0/0
Router(config-if)# pos threshold sd-ber 8
Router(config-if)# pos threshold sf-ber 4
Router(config-if)# pos threshold b1_tca 4
Router(config-if)# end
Router#
```

**Related Commands**

Command	Description
<a href="#">interface</a>	Defines the IP addresses of the server, configures an interface type, and enters interface configuration mode.
<a href="#">pos report</a>	Permits selected SONET alarms to be logged to the console for a POS interface.
<a href="#">show controllers pos</a>	Displays information about the POS controllers.

# power inline

To determine how inline power is applied to the device on the specified Fast Ethernet port, use the **power inline** command in interface configuration mode. To return the setting to its default, use the **no** form of this command.

**power inline {auto | never}**

**no power inline**

## Syntax Description

<b>auto</b>	Automatically detect and power inline devices.
<b>never</b>	Never apply inline power.

## Defaults

Power is applied when a telephone is detected on the port (auto).

## Command Modes

Interface configuration

## Command History

Release	Modification
12.0(5)XU	This command was first introduced.
12.2(2)XT	This command was integrated to support switchport creation on Cisco 2600 series, Cisco 3600 series, and Cisco 3700 series routers.
12.2(8)T	This command was integrated into Cisco IOS Release 12.2(8)T to support switchport creation.

## Examples

The following example shows how to always apply power to the port:

```
Router(config-if)# power inline auto
```

## Related Commands

Command	Description
<b>show power inline</b>	Displays the power status for the specified port or for all ports.
<b>switchport priority extend</b>	Determines how the telephone connected to the specified port handles priority traffic received on its incoming port.
<b>switchport voice vlan</b>	Configures the voice VLAN on the port.

# pulse-time

To enable pulsing data terminal ready (DTR) signal intervals on the serial interfaces, use the **pulse-time** command in interface configuration mode. To restore the default interval, use the **no** form of this command.

**pulse-time** [*msec*] *seconds*

**no pulse-time**

## Syntax Description

<b>msec</b>	(Optional) Specifies the use of milliseconds for the DTR signal interval.
<i>seconds</i>	Integer that specifies the DTR signal interval in seconds. If the <b>msec</b> keyword is configured the DTR signal interval is specified in milliseconds. The default is 0.

## Defaults

0 seconds

## Command Modes

Interface configuration

## Command History

Release	Modification
10.0	This command was introduced.
12.1(5)T	The optional <b>msec</b> keyword was added to configure the interval in milliseconds.

## Usage Guidelines

When the serial line protocol goes down (for example, because of loss of synchronization), the interface hardware is reset and the DTR signal is held inactive for at least the specified interval. This function is useful for handling encrypting or other similar devices that use the toggling of the DTR signal to resynchronize.

Use the optional **msec** keyword to specify the DTR signal interval in milliseconds. A signal interval set to milliseconds is recommended on high-speed serial interfaces (HSSI).

## Examples

The following example enables DTR pulse signals for 3 seconds on serial interface 2:

```
Router(config)# interface serial 2
Router(config-if)# pulse-time 3
```

The following example enables DTR pulse signals for 150 milliseconds on HSSI interface 2/1/0:

```
Router(config)# interface hssi 2/1/0
Router(config-if)# pulse-time msec 150
```

# reset (alarm-interface)

To reset the CPU in the alarm interface controller (AIC), use the **reset** command in alarm interface mode.

```
reset
```

---

**Syntax Description** This command has no arguments or keywords.

---

**Defaults** No default behavior or values

---

**Command Modes** Alarm interface

---

Command History	Release	Modification
	12.2(2)XG	This command was introduced on the Cisco 2600 series and Cisco 3600 series.
	12.2(8)T	This command was integrated into Cisco IOS Release 12.2(8)T.

---

---

**Usage Guidelines** This command does not have a **no** form.

---

**Examples** The following example shows a message that might be returned after the **reset** command is entered:

```
Selected card in slot 1 restarted
```

---

Related Commands	Command	Description
	<b>alarm-interface</b>	Enters alarm interface mode and configures the AIC.

---

# ring-speed

To set the ring speed for the CSC-1R and CSC-2R Token Ring interfaces, use the **ring-speed** command in interface configuration mode.

**ring-speed** *speed*

## Syntax Description

<i>speed</i>	Integer that specifies the ring speed, either 4 for 4-Mbps operation or 16 for 16-Mbps operation. The default is 16.
--------------	--

## Defaults

16-Mbps operation



### Caution

Configuring a ring speed that is wrong or incompatible with the connected Token Ring causes the ring to beacon, which makes the ring nonoperational.

## Command Modes

Interface configuration

## Command History

Release	Modification
10.0	This command was introduced.

## Usage Guidelines

This command does not have a **no** form.

## Examples

The following example sets a Token Ring interface ring speed to 4 Mbps:

```
Router(config)# interface tokenring 0
Router(config-if)# ring-speed 4
```

# scramble

To enable scrambling (encryption) of the payload on a T3 or E3 controller or the PA-E3 and PA-T3 port adapters, use the **scramble** command in interface configuration mode. To disable scrambling, use the **no** form of this command.

**scramble**

**no scramble**

## Syntax Description

This command has no arguments or keywords.

## Defaults

Scrambling is disabled.

## Command Modes

Interface configuration

## Command History

Release	Modification
11.1 CA	This command was introduced.
12.2(11)YT	This command was integrated into Cisco IOS Release 12.2(11)YT and implemented on the following platforms: Cisco 2650XM, Cisco 2651XM, Cisco 2691, Cisco 3660 series, Cisco 3725, and Cisco 3745 routers.
12.2(15)T	This command was integrated into Cisco IOS Release 12.2(15)T.

## Usage Guidelines

T3/E3 scrambling is used to assist clock recovery on the receiving end. Scrambling is designed to randomize the pattern of 1s and 0s carried in the physical layer frame. Randomizing the digital bits can prevent continuous, nonvariable bit patterns—in other words, long strings of all 1s or all 0s. Several physical layer protocols rely on transitions between 1s and 0s to maintain clocking.

Scrambling can prevent some bit patterns from being mistakenly interpreted as alarms by switches placed between the Data Service Units (DSUs).

The local interface configuration must match the remote interface configuration. For example, if you enable scrambling on the local port, you must also do the same on the remote port.

To verify that scrambling is configured on the interface, use the **show controllers serial** or the **show interfaces serial EXEC** commands.

For T3 controllers, all the DSU modes support scrambling except Clear mode.

For E3 controllers, only Kentrox mode supports scrambling.

## Examples

The following example enables scrambling on the PA-E3 port adapter in slot 1, port adapter slot 0, interface 0:

```
Router(config)# interface serial 1/0/0
Router(config-if)# scramble
```

The following example enables scrambling on the controller in slot 1, port 0:

```
Router(config)# interface serial 1/0  
Router(config-if)# scramble
```

---

**Related Commands**

<b>Command</b>	<b>Description</b>
<a href="#">show controllers serial</a>	Displays information that is specific to the serial controllers.
<a href="#">show interfaces serial</a>	Displays information that is specific to the interface hardware.

# serial restart-delay

To set the amount of time that the router waits before trying to bring up a serial interface when it goes down, use the **serial restart-delay** command in interface configuration mode. To restore the default, use the **no** form of the command.

**serial restart-delay** *count*

**no serial restart-delay**

<b>Syntax Description</b>	<i>count</i>	Frequency, in milliseconds, at which the hardware is reset. Range is from 0 to 900. Default is 0.
---------------------------	--------------	---

<b>Defaults</b>	0 milliseconds
-----------------	----------------

<b>Command Modes</b>	Interface configuration
----------------------	-------------------------

<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	11.2 P	This command was introduced.
	12.2(4)T	The <i>count</i> value was changed to set time in milliseconds rather than in seconds.

**Usage Guidelines**

The router resets the hardware each time the serial restart timer expires. This command is often used with the dial backup feature and with the **pulse-time** command, which sets the amount of time to wait before redialing when a DTR dialed device fails to connect.

When the *count* value is set to the default of 0, the hardware is not reset when it goes down. In this way, if the interface is used to answer a call, it does not cause DTR to drop, which can cause a communications device to disconnect.

**Examples**

This examples shows the restart delay on serial interface 0 set to 0:

```
interface Serial0
 serial restart-delay 0
```

<b>Related Commands</b>	<b>Command</b>	<b>Description</b>
	<b>pulse-time</b>	Enables pulsing DTR signal intervals on the serial interfaces.
	<b>show interfaces serial</b>	Displays information about a serial interface.