



## Overview of the OCx Interface Module

The features of the following OCx interface modules are configured based on the SONET and SDH mode support:

- 1-port OC-48/STM-16 or 4-port OC-12/OC-3 / STM-1/STM-4 + 12-port T1/E1 + 4-port T3/E3 CEM Interface Module NCS4200-3GMS
- 1-Port OC-192 or 8-Port Low Rate CEM Interface Module NCS4200-1T8S-10CS
- NCS 4200 1-Port OC-192 or 8-Port Low Rate CEM 20G Bandwidth Interface Module (NCS4200-1T8S-20CS)

### SONET Modes

SONET supports the following Circuit Emulation over Packet (CEP), Structure- Agnostic TDM over Packet (SAToP), and Circuit Emulation over Packet-Switched Network (CESoPSN) modes:

#### CEP Modes

- STS-48C
- STS-12C
- STS-3C
- STS-1
- VT 1.5

#### SAToP or CESoP

- VT1.5-T1
- T3
- CT3-T1

The following table provides required clock and CEM configuration that is supported on each of the SONET mode:

Table 1: Modes Supported on SONET

	STS-48C	STS-12C	STS-3C	STS-1	VT 1.5	VT 1.5 T1	T3	CT3-T1
<b>Required Configuration</b>								
<b>Mode</b>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>Internal/Line Clock Source</b>	Internal	Internal	Internal	Internal	Internal	Yes	Yes	Yes
<b>ACR/DCR Clock</b>	NA	NA	NA	NA	NA	Yes	Yes	Yes
<b>CEM Configurations</b>								
<b>CEP</b>	Yes	Yes	Yes	Yes	Yes	NA	Yes	NA
<b>SAToP Framed</b>	NA	NA	NA	NA	NA	Yes	Yes	Yes
<b>SAToP Unframed</b>	NA	NA	NA	NA	NA	Yes	Yes	Yes
<b>CESoPSN</b>	NA	NA	NA	NA	NA	Yes	Yes	Yes
<b>Interworking Multiservice Gateway (iMSG)</b>								
<a href="#">1</a>								
<b>iMSG</b>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>Serial Interfaces</b>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>iMSG ACR</b>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>Multilink Interfaces</b>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>VLAN Handoff</b>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>OCx Port Protection</b>								
<b>APS</b>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>OCx Path Protection</b>								
<b>UPSR</b>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>UPSR over HDLC</b>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

<sup>1</sup> Supports Channelized T3/E3 or T1/E1

**SDH Modes**

SDH supports the following modes:

- AU-4-16c (VC4-16c)
- AU-4-4c (VC4-4c)
- AU-4 (VC4)
- AU-4 — TUG-3 — VC-3 — T3 (TUG-3 — T3)
- AU-4 — TUG-3 — VC-3 — E3 (TUG-3 — E3)
- AU-4 — TUG-3 — TUG-2 — VC-11 (TUG-2 — VC-11)
- AU-4 — TUG-3 — TUG-2 — VC-12 (TUG-2 — VC-12)
- AU-4 — TUG-3 — TUG-2 — VC-12 — E1 (TUG-2 — E1)
- AU-3 — VC-3 — T3 (VC-3 — T3)
- AU-3 — TUG-2 — VC-11 — T1 (TUG-2 — T1)
- AU-3 — TUG-2 — VC-11 (TUG-2 — VC-11)
- AU-3 — TUG-2 — VC-12 (TUG-2 — VC-12)
- AU-3 — VC-3 — E3 (VC-3 — T3)

The following table provides required clock and CEM configuration that is supported on each of the SDH mode. The SDH modes provided in brackets are only for the documentation purpose:

**Table 2: Modes Supported on SDH**

	<b>VC4-16c</b>	<b>VC4-4c</b>	<b>VC4</b>	<b>TUG-2-VC11</b>	<b>TUG-2-VC12</b>	<b>TUG-3-E3</b>	<b>TUG-3-T3</b>	<b>TUG2VC11-T1</b>	<b>TUG2VC12-E1</b>
<b>Required Configuration</b>									
<b>Mode</b>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>Internal/Line Clock Source</b>	Internal	Internal	Internal	Internal	Internal	Yes	Yes	Yes	Yes
<b>ACR/DCR Clock</b>	NA	NA	NA	NA	NA	Yes	Yes	Yes	Yes
<b>CEM Configurations</b>									
<b>CEP</b>	Yes	Yes	Yes	Yes	Yes	NA	NA	NA	NA
<b>SAToP Framed</b>	NA	NA	NA	NA	NA	Yes	Yes	Yes	Yes

	<b>VC4-16c</b>	<b>VC4-4c</b>	<b>VC4</b>	<b>TUG-2-VC11</b>	<b>TUG-2-VC12</b>	<b>TUG-3-E3</b>	<b>TUG-3-T3</b>	<b>TUG2VC1-T1</b>	<b>TUG2VC2-T2</b>
<b>SAToP Unframed</b>	NA	NA	NA	NA	NA	Yes	Yes	Yes	Yes
<b>CESoPSN</b>	NA	NA	NA	NA	NA	Yes	Yes	Yes	Yes
<b>Interworking Multiservice Gateway (iMSG)</b>									
<b>iMSG</b>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>Serial Interfaces</b>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>iMSG ACR</b>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>OCx Port Protection</b>									
<b>MSP</b>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>OCx Path Protection</b>									
<b>SNCP</b>	Yes	Yes	Yes	Yes	Yes	NA	NA	NA	NA