Software version TC4
FEBRUARY 2011

The Physical Interface Guide

Cisco Telepresence System Codec C90

What's in this guide?

The top menu bar and the entries in the Table of Contents are all hyperlinks, just click on them to go to the topic.

We recommend you visit our web site regularly for updated versions of the user documentation. Go to: http://www.cisco.com/go/telepresence/docs - and navigate in the right pane to find the TelePresence product documentation.

Table of Contents

Chapter 1

Introduction

About this guide

The purpose of this document is to describe the physical interface for the Codec C Series listed below.:

- Cisco TelePresence System Codec C90

User documentation

The user documentation for the Cisco TelePresence systems, running the **TC software**, have several guides suitable to various user groups.

- Video conference room primer
- Video conference room acoustics guidelines
- Installation guides for the TelePresence systems
- Software release notes for the TC software
- Getting started guide for the TelePresence systems
- User guide for the TelePresence systems
  - When using the Touch controller, ref. TC4.1 version of the user guide
  - When using the Remote Control, ref. TC4.0 version of the user guide
- Quick reference guides for the TelePresence systems
- Administrator guides for the TelePresence systems
- Camera user guide for the PrecisionHD cameras
- API reference guides for the Codec C Series
- TC Console user guide for the Codec C Series
- Physical interfaces guides for the Codec C Series
- Regulatory compliance and safety information guides
- Legal & license information for products using TC software

Download the user documentation

Go to: ▶ http://www.cisco.com/go/telepresence/docs

- in the right pane, select:

- *TelePresence Peripherals* for the PrecisionHD cameras, microphones, Touch unit, and remote controls.
- *TelePresence Solutions Platform* for the Codec C Series and Quick Set C20.

Software download

Go to: ▶ http://www.cisco.com/cisco/software/navigator.html

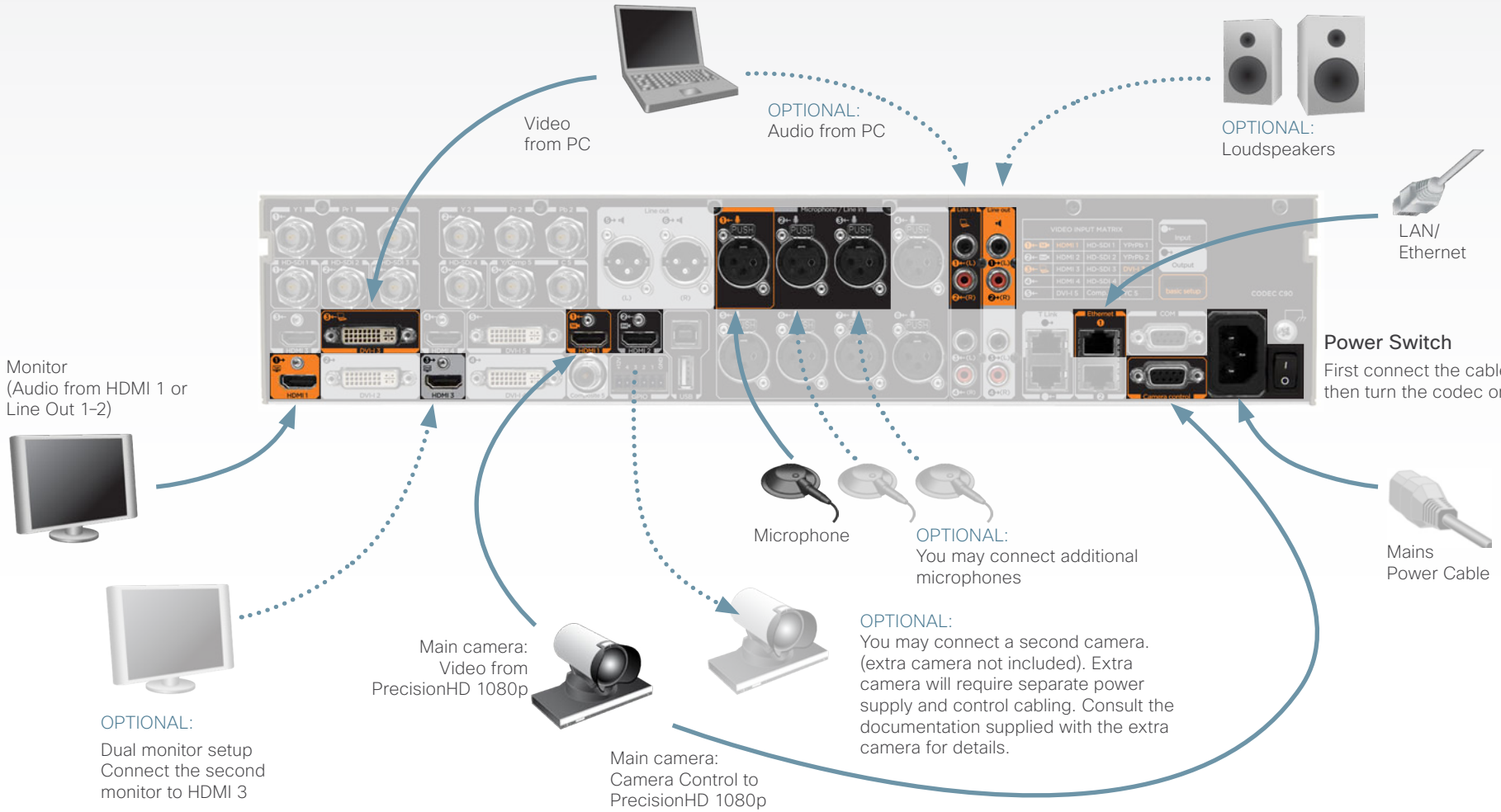
Chapter 2

Connecting to the codec

Basic setup when connecting to Codec C90

The illustration shows you the basic setup when connecting the monitor, PC, camera, microphone, loudspeakers (if applicable), LAN and line voltage to your codec.

Inputs	Outputs	Basic Setup
1	1	The main connectors for basic setup are highlighted in orange.



Make sure the codec has been switched off and disconnected from the line voltage whenever connecting or disconnecting other equipment.

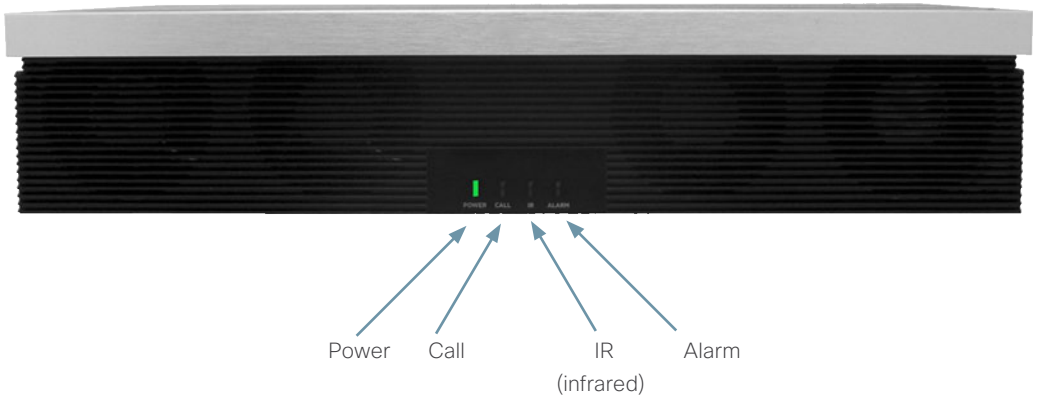
Chapter 3

The physical interface

The front panel

There are four LED's in the front of the Codec:

- Power – The POWER LED turns ON when power is connected, otherwise OFF
- Call – The CALL LED turns ON when there are active calls on the codec, otherwise OFF
- Infrared – The IR LED flashes when infrared signals are received
- Alarm – The ALARM LED turns ON when there is no connection to the network, otherwise OFF



Rear panel sockets overview

The Codec C90 provides great flexibility for the connection of audio and video equipment.

The illustration below shows the rear panel of the Codec C90.

Inputs	Outputs	Basic Setup
1 ←	→ 1	The main connectors for basic setup are highlighted in orange.

Video sockets

The video input sockets comprise:

- 4xHDMI
- 4xHD-SDI
- 2xDVI-I
- 2xAnalog Component (Y-Pr-Pb)
- 1xComposite or 1xS-Video(YC)

The video output sockets comprise:

- 2xHDMI
- 2xDVI-I
- 1 Composite

Audio sockets

The audio input sockets comprise:

- 8xXLR Female – Microphone/Line In
- 4xRCA – Line In (1 Left, 2 Right, 3 Left, 4 Right)
- 2xHDMI

The audio output sockets comprise:

- 2xXLR Male – Line Out
- 4xRCA – 1 Left (SPDIF), 2 Right, 3 Left (SPDIF), 4 Right
- 2xHDMI

Other sockets

The other sockets comprise:

- Ethernet 1 and Ethernet 2
- COM – Serial data port
- Camera control, serial port
- Power socket
- Grounding – Chassis grounding
- Power On/Off switch
- GPIO–General purpose Input/Output
- USB Host*, USB Device*, T Link*

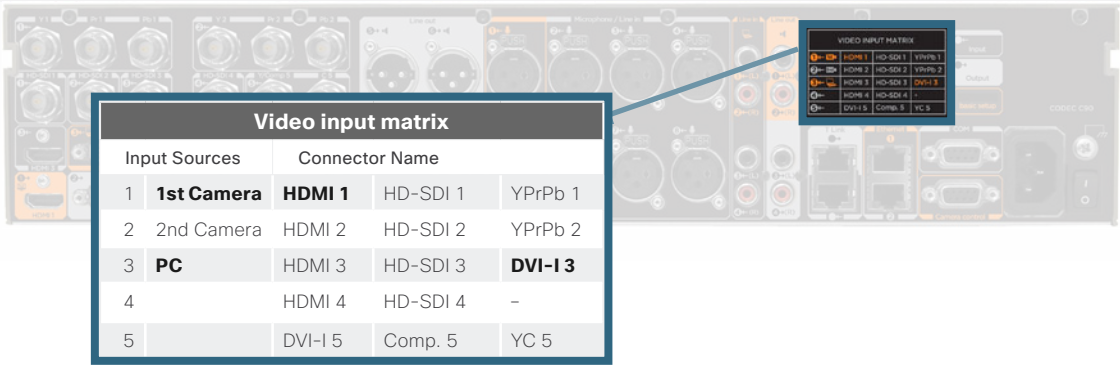
* For future use

Codec C90 Rear Panel

The following pages give a detailed description of the rear panel sockets and connectors.

The Video Input Matrix

The video input matrix is found at the underside side of the codec. The matrix illustrates the combinations in which the video inputs can be connected.



Video input matrix

Input Sources		Connector Name		
1	**1st Camera**	**HDMI 1**	HD-SDI 1	YPrPb 1
2	2nd Camera	HDMI 2	HD-SDI 2	YPrPb 2
3	**PC**	HDMI 3	HD-SDI 3	**DVI-I 3**
4		HDMI 4	HD-SDI 4	-
5		DVI-I 5	Comp. 5	YC 5

About the matrix

Only one video input source from each row can be active at any time.

The numbers in the left column represents the Video Input Sources 1–5. The main connectors, which are used in basic setup, are marked in orange color on the codec.

Note that the Comp. 5 and S-Video (YC) 5 inputs uses the same physical connectors and can not be connected at the same time.

Configure the video inputs

You can configure the video input settings from the Advanced configuration menu or by running API commands.

The Advanced configuration menu

Go to the on screen menu to configure the video input sources.

- Navigate to: *Settings > Advanced > Advanced Configuration > Video > Input > Source 1*. Configure the video input connectors, quality and name. See the video input matrix. Only one video input source from each row in the matrix, can be active at any time.
- Navigate to: *Settings > Advanced > Advanced Configuration > Video > MainVideoSource*. Configure the main video source.
- Navigate to: *Settings > Advanced > Advanced Configuration > Video > DefaultPresentationSource*. Configure the default presentation source.

The API commands

Open a *telnet* or *ssh* session, to the codec, to issue the API commands.

Configure the video input connectors. See the video input matrix. Only one video input source from each row in the matrix, can be active at any time:

- `xconfiguration video input source 1 connector: hdmi`
- `xconfiguration video input source 2 connector: hdmi`
- `xconfiguration video input source 3 connector: dvi`
- `xconfiguration video input source 4 connector: hdmi`
- `xconfiguration video input source 5 connector: dvi`

Configure the video quality and define a name of the video inputs 1 to 5:

- `xconfiguration video input source 1 quality: motion`
- `xconfiguration video input source 1 name: "Main Camera"`

Configure the main video source. Here, the main video source is the camera, connected to video input source 1:

- `xconfiguration video mainvideosource: 1`

Configure the default presentation source. Here, the default presentation source is a PC, and the PC is connected to video input source 3 connector:

- `xconfiguration video defaultpresentationsource: 3`

The default values

- Video Input Source 1 Connector: HDMI
- Video Input Source 2 Connector: HDMI
- Video Input Source 3 Connector: DVI
- Video Input Source 4 Connector: HDMI
- Video Input Source 5 Connector: DVI
- Video Input Source 1 Name: “Main Camera“
- Video Input Source 2 Name: “Secondary Camera“
- Video Input Source 3 Name: “PC“
- Video Input Source 4 Name: “DVD“
- Video Input Source 5 Name: “Document Camera“
- Video Input Source 1 Quality: Motion
- Video Input Source 2 Quality: Motion
- Video Input Source 3 Quality: Sharpness
- Video Input Source 4 Quality: Motion
- Video Input Source 5 Quality: Sharpness
- Video MainVideoSource: 1
- Video DefaultPresentationSource: 3

Video inputs

All video inputs can not be active at the same time. Please refer to the Video Input Matrix on the previous page to see an overview.

Component 1–2 (Y-Pr-Pb)

2 x 3 BNC sockets, analog video input 1, 2.

There are three BNC connectors for each Component interface; Y (luma), Pr (red), Pb (blue).

Typical use: Camera, DVD and Content player.

HD-SDI 1–4

4 x BNC sockets, digital video input 1, 2, 3, 4.

Typical use: Cameras.

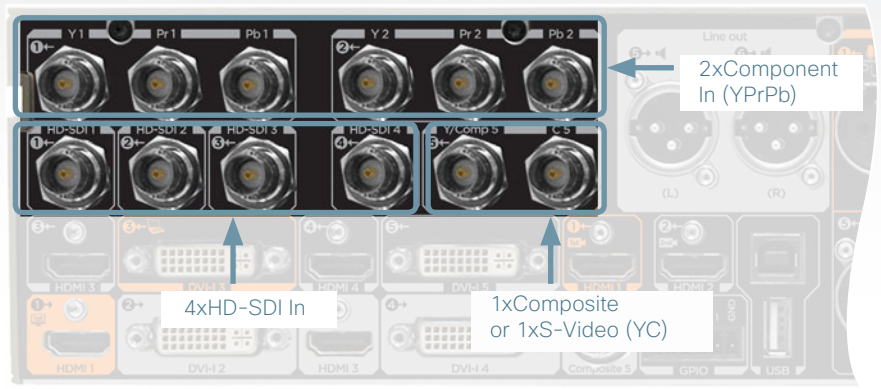
Composite 5 / S-Video (YC) 5

2 x BNC sockets, analog video input 5.

The S-Video (YC) and the composite inputs uses the same physical connectors, and will not be able to be connected at the same time.

- S-Video 5 - Connect to the Y/Comp 5 (luma) and C 5 (chroma) connectors
- Composite 5 - Connect to Comp 5 connector

Typical use: Camera and DVD.



BNC pin-out

External view of socket

BNC: Bayonet Neill-Concelman

HD-SDI: High Definition - Serial Digital Interface

Y-Pr-Pb: Y: Information about luma (luminance); Pr: Red color; Pb: Blue color

Y-C: Y: Information about luma (luminance); C: Information about chroma (color)

Levels

HD-SDI

0.8 Vpp, 75 Ω

SMPTE 259M (270 Mbps)

SMPTE 292M (1.485, 1.485/1.001 Gbps)

Y-Pb-Pr

Y: 1V Vpp, 75 Ω

Pb: 0.7 Vpp, 75 Ω

Pr: 0.7 Vpp, 75 Ω

Composite. 1 Vpp, 75 Ω

S-Video (YC)

Y: 1 Vpp, 75 Ω

C (PAL): 0.3 Vpp, 75 Ω

C (NTSC): 0.28 Vpp, 75 Ω

Video inputs, *continued...*

All video inputs can not be active at the same time. Please refer to the Video Input Matrix (two pages back) to see an overview.

HDMI 1–4

4 x HDMI sockets, digital video input 1–4. Audio input on 3 and 4.

HDMI – High Definition Multimedia Interface (digital, sound & picture)

Typical use: Camera, DVD, PC.

Main connector. The HDMI 1 input is the main connector to the PrecisionHD 1080p camera.

DVI-I 3 and 5

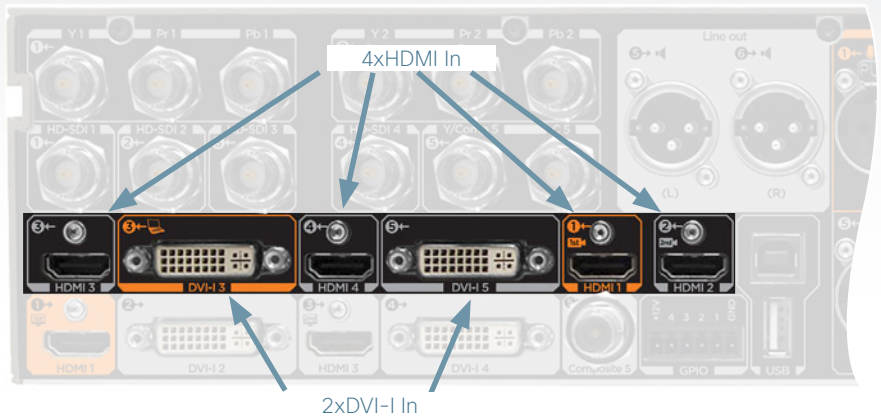
2 x DVI-I sockets, digital/analog video input 3, 5.

- DVI-D
- DVI-A (Analog RGB/VGA)
- DVI-A Analog component/YPbPr

DVI-I – Digital Video Interface – Integrated (digital DVI-D and analog DVI-A)

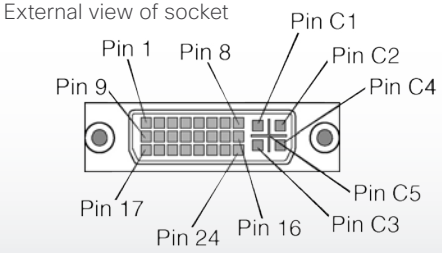
Typical use: Two digital video inputs for PC presentations or used for the PrecisionHD camera.

Main connector. The DVI-I 3 is the main connector for PC input.



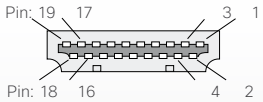
DVI-I pin-out

External view of socket



HDMI pin-out

External view of socket



HDMI Pin-out

Pin	Assignment	Pin	Assignment
1	T.M.D.S. Data 2+	11	T.M.D.S. Clock Shield
2	T.M.D.S. Data 2 Shield	12	T.M.D.S. Clock–
3	T.M.D.S. Data 2–	13	CEC
4	T.M.D.S. Data 1	14	Reserved (N.C. on device)
5	T.M.D.S. Data 1 Shield	15	SCL
6	T.M.D.S. Data 1–	16	SDA
7	T.M.D.S. Data 0	17	DDC/CEC Ground
8	T.M.D.S. Data 0 Shield	18	+5 V Power (max 50 mA)
9	T.M.D.S. Data 0–	19	Hot Plug Detect
10	T.M.D.S. Clock+		

Video input formats

4 x HDMI inputs, supported formats

- 1920 x 1080@60, 59.94 Hz (1080p60)
- 1920 x 1080@50 Hz (1080p50)
- 1920 x 1080@30, 29.97 Hz (1080p30)
- 1920 x 1080@25 Hz (1080p25)
- 1920 x 1080@24, 23.97 Hz (1080p24)
- 1920 x 1200@50 Hz (WUXGA)
- 1680 x 1050@60 Hz (WSXGA+)
- 1600 x 1200@50, 60 Hz (UXGA)
- 1440 X 900@60 Hz (WXGA+)
- 1400 x 1050@60, 75 Hz
- 1366 x 768@60 Hz
- 1360 x 768@60 Hz
- 1280 x 1024@60, 75, 85 Hz (SXGA)
- 1280 x 960@60, 85 Hz
- 1280 x 800@60 Hz (WXGA)
- 1280 x 768@60, 75, 85 Hz (WXGA)
- 1280 x 720@60, 59.94 Hz (720p60)
- 1280 x 720@50 Hz (720p50)
- 1152 x 864@75 Hz
- 1024 x 768@60, 70, 75, 85 Hz (XGA)
- 848 x 480@60 Hz
- 800 x 600@56, 60, 72, 75, 85 Hz (SVGA)
- 720 x 576@50 Hz (576p50)
- 720 x 480@60, 59.94 Hz (480p60)
- 640 x 480@60, 72, 75, 85 Hz (VGA)

4 x HD-SDI inputs, supported formats

- 1920 x 1080@30 Hz (1080p30)
- 1920 x 1080@25 Hz (1080p25)
- 1280 x 720@60 Hz (720p60)
- 1280 x 720@50 Hz (720p50)
- 1280 x 720@30 Hz (720p30)
- 1280 x 720@25 Hz (720p25)

2 x DVI-I inputs, supported formats

Digital (DVI-D)

- Same as HDMI inputs, ref. above.

Analog RGB (DVI-A)

- 1920 x 1080@60 Hz (1080p60)
- 1920 x 1200@50 Hz (WUXGA)
- 1680 x 1050@60 Hz (WSXGA+)
- 1600 x 1200@60 Hz (UXGA)
- 1440 x 900@60 Hz (WXGA+)
- 1400 x 1050@60, 75 Hz
- 1366 x 768@60 Hz
- 1360 x 768@60 Hz
- 1280 x 1024@60, 75, 85 Hz (SXGA)
- 1280 x 960@60, 85 Hz
- 1280 x 800@60 Hz (WXGA)
- 1280 x 768@60, 75, 85 Hz (WXGA)
- 1280 x 720@60 Hz (720p60)
- 1152 x 864@75 Hz
- 1024 x 768@60, 70, 75, 85 Hz (XGA)
- 848 x 480@60 Hz
- 800 x 600@56, 60, 72, 75, 85 Hz (SVGA)
- 720 x 576@50 Hz
- 720 x 480@60, 59.94 Hz (480p60)
- 640 x 480@60, 72, 75, 85 Hz (VGA)

Analog YPbPr (DVI-A)

- Same as YPbPr inputs, ref. below.

Extended Display Identification Data (EDID)

2 x YPbPr inputs, supported formats

- 1920 x 1080@60 Hz (1080p60)
- 1920 x 1080@50 Hz (1080p50)
- 1920 x 1080@30 Hz (1080p30)
- 1920 x 1080@25 Hz (1080p25)
- 1280 x 720@60 Hz (720p60)
- 1280 x 720@50 Hz (720p50)
- 1280 x 720@30 Hz (720p30)
- 720 x 576@50 Hz (576p50)
- 720 x 480@60 Hz (480p60)

1 x S-Video/Composite input, supported formats

- PAL/NTSC

Video outputs

HDMI 1 and 3

2 x HDMI sockets, digital video and audio output 1, 3.

HDMI – High Definition Multimedia Interface (digital, sound & picture).

Typical use: Monitor, recording device.

Main connector. The HDMI output 1 is the main connector to the monitor.

Dual monitor. Dual output is provided on HDMI output 3.

DVI-I 2 and 4

2 x DVI-I sockets, digital/analog video output 2, 4.

- DVI-D.
- DVI-A (Analog RGB / VGA).

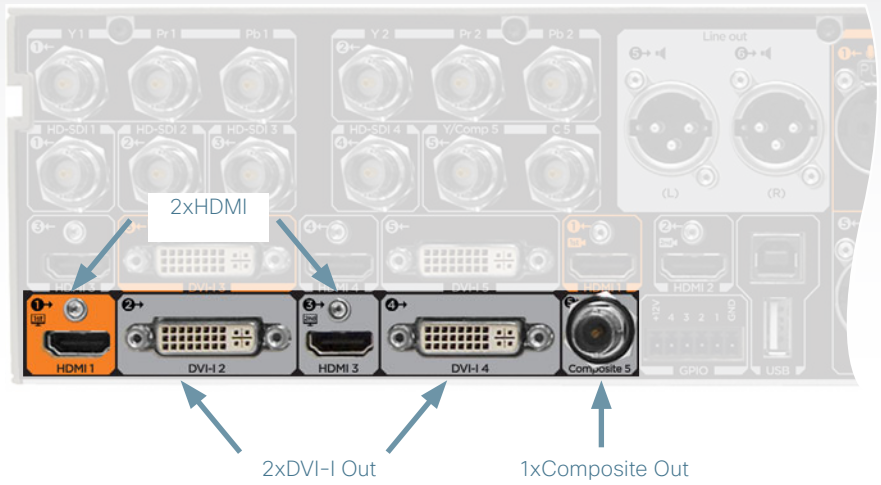
DVI-I – Digital Video Interface – Integrated (digital DVI-D and analog DVI-A).

Typical use: Monitors.

Composite 5

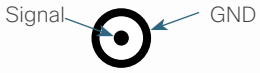
1 x BNC sockets, analog video output 5.

Typical use: Monitor.



BNC pin-out

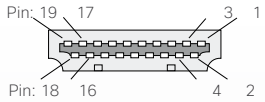
External view of socket



BNC – Bayonet Neill-Concelman

HDMI pin-out

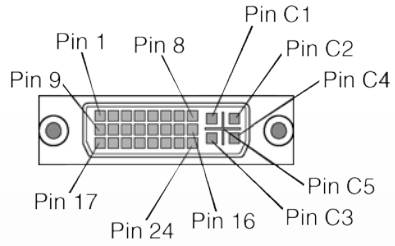
External view of socket



Please refer to previous page for pin-out scheme.

DVI-I pin-out

External view of socket



Video output formats

2 x HDMI and 2 x DVI-I outputs, supported formats

- 1920 x 1080@60 Hz (1080p60)
- 1920 x 1200@60Hz (WUXGA)
- 1600 x 1200@60 Hz (UXGA)
- 1366 x 768@60 Hz
- 1360 x 768@60 Hz
- 1280 x 720@60 Hz (720p60)
- 1280 x 1024@60 Hz (SXGA)
- 1280 x 768@60 Hz (WXGA)
- 1024 x 768@60 Hz (XGA)
- 800 x 600@60 Hz (SVGA)
- 640 x 480@60 Hz (VGA)

VESA Monitor Power Management

1 x Composite output, supported formats

BNC Connector

- PAL/NTSC

Levels

Composite. 1 Vpp, 75 Ω

Audio inputs

Unused, but connected audio inputs must be set to Off to avoid unwanted audio/noise.

Microphone/Line In 1–8 (XLR)

8 x Balanced XLR sockets, audio input 1–8.

Main connector. The Microphone/Line In 1 is the main connector for the microphone.

All eight microphone inputs are for balanced electret microphones, 48V phantom powered via XLR connectors.

The phantom powering of all eight XLR sockets can be individually switched off. The input will then be a balanced line level input.

All Microphone/Line In 1–8 are equipped with acoustic echo canceller.

Use Microphone/Line In 1–8 to connect to an external microphone amplifier or an external mixer.

Default configuration. In default configuration, all Microphone/Line In inputs are enabled and configured as microphones.

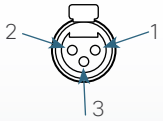
HDMI In 3, 4

2 x HDMI connectors, audio input 3, 4

Typical use: Use HDMI In 3 or 4 (2–8 channels) to connect to external playback devices as DVD players. Each input support up to two channels at 48kHz sampling rate.

XLR pin-out

External view of socket

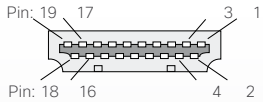


Pin 1: Gnd
Pin 2: Hot
Pin 3: Cold/neutral

XLR - Electrical Connector (Cannon XL series with Rubber compound)

HDMI pin-out

External view of socket



Please refer to previous page for pin-out scheme.

Audio inputs, *continued...*

Unused, but connected audio inputs must be set to Off to avoid unwanted audio/noise.

Line In 1–4 (RCA)

4 x RCA sockets, audio input 1–4

Audio Line In 1–4 are used when connecting to PC and to external playback devices, such as VCR's or DVD players.

Main connectors. The Line In 1 (left) and Line In 2 (right) are the main connectors to a PC.

Stereo. For systems with stereo I/O the audio inputs can be configured in stereo pairs:

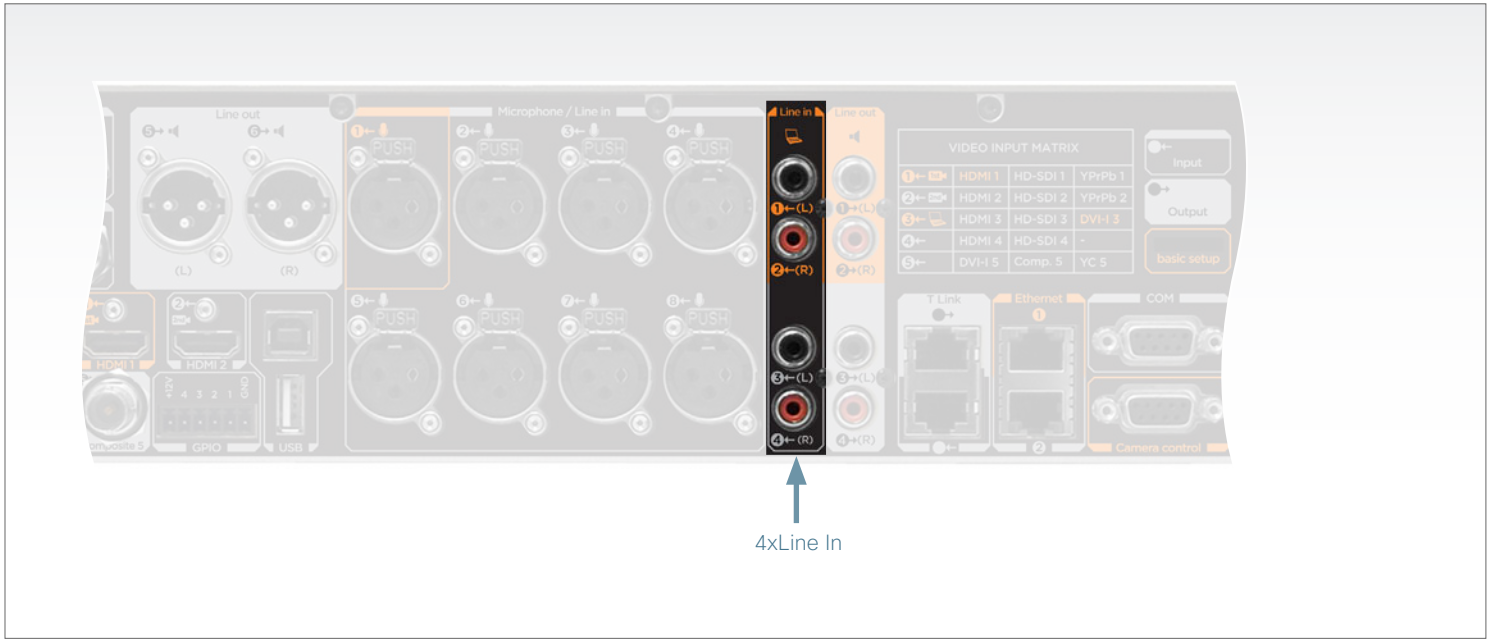
- Connect the left channel to Line In 1 or 3
- Connect the right channel to Line In 2 or 4

Default configuration for Line In 1–2. In the default configuration Line In 1 and 2 are configured as stereo inputs for external playback devices, such as a PC.

Default configuration for Line In 3–4. In the default configuration Line In 3 and 4 are configured as stereo input pairs. The two inputs are paired with Line Out 3 and 4 respectively.

This pairing will avoid feedback situations that can arise when playback/recording devices are in standby mode (Loop suppression).

Line In 3 and 4 are used with external playback devices as VCR's and DVD players.



RCA pin-out

External view of socket

RCA - Phono Plug (the Radio Corporation of America)

Audio outputs

Line Out 5–6 (XLR)

2 x Balanced XLR sockets, audio output 5–6.

Audio Line Out 5–6 are balanced outputs, for connection to balanced speakers.

Default configuration. In default configuration Line Out 5 is configured as Left speaker, and Line Out 6 is configured as right speaker.

HDMI Out 1, 3

2 x HDMI connectors, audio out 1, 3

Use HDMI Out 1 to connect to a flat screen with speakers. HDMI 1 will provide stereo audio speaker signals at 48kHz.

Use HDMI Out 3 to connect to a DVD recorder. HDMI will provide stereo line output signals at 48kHz. Includes local microphones.

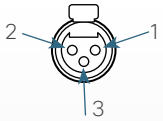
Main connector. The HDMI output 1 is the main connector to the monitor.

HDMI 1. Audio from far end and PC.

HDMI 3. All audio mixed together for recordings.

XLR pin-out

External view of socket



Pin 1: Gnd
Pin 2: Hot
Pin 3: Cold/neutral

XLR - Electrical Connector (Cannon XL series with Rubber compound)

What is a Line output

A Line output consists of all signals from the local side and all signals from the far end side.

What is a Speaker output

A Speaker output consists of all signals from the local side, except microphones, and all signals from the far end side.

Left channel

The Left channel consists of all the Left channel and Mono signals.

Right channel

The Right channel consists of all the Right channel and Mono signals.

Audio outputs, *continued...*

Line Out 1–4 (RCA)

4xRCA sockets, audio output 1–4

Can be configured as two stereo pairs.

Main connectors. Line Out 1 (left) and Line Out 2 (right) are the main connectors to the local loudspeaker system.

The local loudspeaker system may or may not include the DNAM (Digital Natural Audio Module).

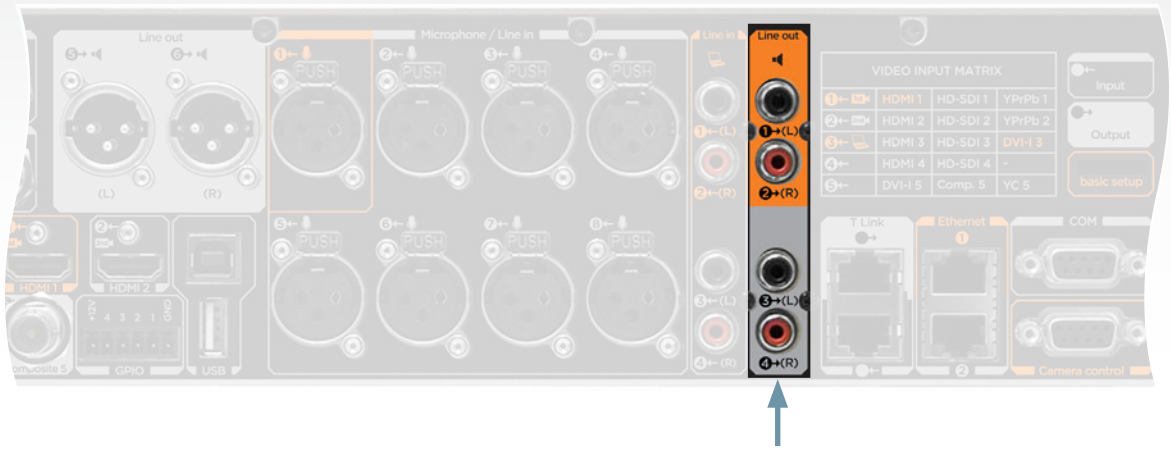
Default configuration Line Out 1–2. In default configuration, Line Out 1 and 2 are configured as stereo speakers.

if a DNAM is present or SPDIF is active on Line Out 1, then Line Out 1 provides a digital stereo speaker signal and Line Out 2 is not active.

Default configuration Line Out 3–4. In default configuration, Line Out 3 and 4 are configured as stereo line out for external recording devices as VCR's or DVD recorders.

if a DNAM is present or SPDIF is active on Line Out 3, then Line Out 3 provides a digital stereo speaker signal and Line Out 4 is not active.

SPDIF – Sony/Philips Digital Interface, used by the Digital Natural Audio Module.



RCA pin-out

External view of socket

RCA – Phono Plug (the Radio Corporation of America)

What is a Line output

A Line output consists of all signals from local side and all signals from far end side.

What is a Speaker output

A Speaker output consists of all signals from local side, except microphones, and all signals from far end side.

Left channel

The Left channel consists of all Left channel and Mono signals.

Right channel

The Right channel consists of all Right channel and Mono signals.

Audio signal levels tables

Microphone Inputs 1 to 8 XLR female

Signal levels	Clipping level		Nominal level
Level setting [dB]	[mVpp]	[dBu]	[dBu]
0.0	275.0	-18.0	-36.0
1.0	245.1	-19.0	-37.0
2.0	218.4	-20.0	-38.0
3.0	194.7	-21.0	-39.0
4.0	173.5	-22.0	-40.0
5.0	154.6	-23.0	-41.0
6.0	137.8	-24.0	-42.0
7.0	122.8	-25.0	-43.0
8.0	109.5	-26.0	-44.0
9.0	97.6	-27.0	-45.0
10.0	87.0	-28.0	-46.0
11.0	77.5	-29.0	-47.0
12.0	69.1	-30.0	-48.0
13.0	61.6	-31.0	-49.0
14.0	54.9	-32.0	-50.0
15.0	48.9	-33.0	-51.0
16.0	43.6	-34.0	-52.0
17.0	38.8	-35.0	-53.0
18.0	34,6	-36.0	-54.0
19.0	30,9	-37.0	-55.0
20.0	27,5	-38.0	-56.0
21.0	24,5	-39.0	-57.0
22.0	21,8	-40.0	-58.0
23.0	19,5	-41.0	-59.0
24.0	17,4	-42.0	-60.0

This specification is valid for Mic 1–8 inputs if Microphone Level setting is selected.

Line Inputs 1 to 8 XLR female

Signal levels	Clipping level		Nominal level
Level setting [dB]	[Vpp]	[dBu]	[dBu]
0.0	34.7	24.0	6.0
1.0	31.0	23.0	5.0
2.0	27.6	22.0	4.0
3.0	24.6	21.0	3.0
4.0	21.9	20.0	2.0
5.0	19.5	19.0	1.0
6.0	17.4	18.0	0.0
7.0	15.5	17.0	-1.0
8.0	13.8	16.0	-2.0
9.0	12.3	15.0	-3.0
10.0	11.0	14.0	-4.0
11.0	9.8	13.0	-5.0
12.0	8.7	12.0	-6.0
13.0	7.8	11.0	-7.0
14.0	6.9	10.0	-8.0
15.0	6.2	9.0	-9.0
16.0	5.5	8.0	-10.0
17.0	4.9	7.0	-11.0
18.0	4,4	6.0	-12.0
19.0	3,9	5.0	-13.0
20.0	3,5	4.0	-14.0
21.0	3,1	3.0	-15.0
22.0	2,8	2.0	-16.0
23.0	2,5	1.0	-17.0
24.0	2,2	0.0	-18.0

This specification is valid for Line 1–8 inputs if Line Level setting is selected.

Line outputs 5 to 6 XLR male

Signal levels	Absolute max output level		Nominal level
Level setting [dB]	[Vpp]	[dBu]	[dBu]
-24.0	2,2	0.0	-18.0
-23.0	2,5	1.0	-17.0
-22.0	2,8	2.0	-16.0
-21.0	3,1	3.0	-15.0
-20.0	3,5	4.0	-14.0
-19.0	3,9	5.0	-13.0
-18.0	4.4	6.0	-12.0
-17.0	4.9	7.0	-11.0
-16.0	5.5	8.0	-10.0
-15.0	6.2	9.0	-9.0
-14.0	6.9	10.0	-8.0
-13.0	7.8	11.0	-7.0
-12.0	8.7	12.0	-6.0
-11.0	9.8	13.0	-5.0
-10.0	11.0	14.0	-4.0
-9.0	12.4	15.0	-3.0
-8.0	13.9	16.0	-2.0
-7.0	15.6	17.0	-1.0
-6.0	17.5	18.0	0.0
-5.0	19.6	19.0	1.0
-4.0	22.0	20.0	2.0
-3.0	24.7	21.0	3.0
-2.0	27.7	22.0	4.0
-1.0	31.0	23.0	5.0
0.0	34.8	24.0	6.0

Line Inputs 1 to 4 Female RCA/phone

Signal levels	Clipping level		Nominal level
Level setting [dB]	[Vpp]	[dBu]	[dBu]
0.0	17.4	18.0	0.0
1.0	15.5	17.0	-1.0
2.0	13.8	16.0	-2.0
3.0	12.3	15.0	-3.0
4.0	11.0	14.0	-4.0
5.0	9.8	13.0	-5.0
6.0	8.7	12.0	-6.0
7.0	7.8	11.0	-7.0
8.0	6.9	10.0	-8.0
9.0	6.2	9.0	-9.0
10.0	5.5	8.0	-10.0
11.0	4.9	7.0	-11.0
12.0	4.4	6.0	-12.0
13.0	3.9	5.0	-13.0
14.0	3.5	4.0	-14.0
15.0	3.1	3.0	-15.0
16.0	2.8	2.0	-16.0
17.0	2.5	1.0	-17.0
18.0	2,2	0.0	-18.0
19.0	2,0	-1.0	-19.0
20.0	1,7	-2.0	-20.0
21.0	1,6	-3.0	-21.0
22.0	1,4	-4.0	-22.0
23.0	1,2	-5.0	-23.0
24.0	1,1	-6.0	-24.0

Notes:

1. Default levels are marked with white text on black
2. For the dBu value for input clipping level and absolute max output level, a sine waveform is assumed
3. If numbers in dBV are required, dBV value is 2.2 dB lower than the dBu value.
   Example: -10 dBu equals -12.2 dBV

Audio signal levels, *cont...*

Line outputs 1 to 4 Female RCA/phone			
Signal levels	Absolute max output level		Nominal level
Level setting [dB]	[Vpp]	[dBu]	[dBu]
-24.0	1,1	-6.0	-24.0
-23.0	1,2	-5.0	-23.0
-22.0	1,4	-4.0	-22.0
-21.0	1,5	-3.0	-21.0
-20.0	1,7	-2.0	-20.0
-19.0	1,9	-1.0	-19.0
-18.0	2,2	0.0	-18.0
-17.0	2.5	1.0	-17.0
-16.0	2.8	2.0	-16.0
-15.0	3.1	3.0	-15.0
-14.0	3.5	4.0	-14.0
-13.0	3.9	5.0	-13.0
-12.0	4.4	6.0	-12.0
-11.0	4.9	7.0	-11.0
-10.0	5.5	8.0	-10.0
-9.0	6.2	9.0	-9.0
-8.0	6.9	10.0	-8.0
-7.0	7.8	11.0	-7.0
-6.0	8.7	12.0	-6.0
-5.0	9.8	13.0	-5.0
-4.0	11.0	14.0	-4.0
-3.0	12.3	15.0	-3.0
-2.0	13.8	16.0	-2.0
-1.0	15.5	17.0	-1.0
0.0	17.4	18.0	0.0

Notes:

1. Default levels are marked with white text on black
2. For the dBu value for input clipping level and absolute max output level, a sine waveform is assumed
3. If numbers in dBV are required, dBV value is 2.2 dB lower than the dBu value.
   Example: -10 dBu equals -12.2 dBV

Audio hardware information table

Hardware Information					
	Mic 1-8 *	Line in 1-8 **	Line out 5-6	Line in 1-4	Line out 1-4
Signal type	Balanced	Balanced	Balanced	Unbalanced	Unbalanced
Connector (codec)	XLR-F	XLR-F	XLR-M	Female RCA/phono	Female RCA/phono
Input impedance	8100 Ohm (pin 2-3)	10k Ohm (pin 2-3)		10k Ohm	
Output impedance			50 Ohm		100 Ohm
Max input level when set to Min input level	-18dBu/275mVpp	24dBu/34.7Vpp		18dBu/17.4Vpp	
Max input level when set to Max input level	-42dBu/35mVpp	0dBu/4.4Vpp		-6dBu/2.2Vpp	
Max output level when set to Min output level			0dBu/4.4Vpp		-6dBu/2.2Vpp
Max output level when set to Max output level			24dBu/34.8Vpp		18dBu/17.4Vpp
Gain range	<-24dB (24 steps of 1dB) ->				
Phantom power	48 Volt +/- 2%				
Phantom power resistor pin 1	6800 Ohm				
Phantom power resistor pin 2	6800 Ohm				
Max phantom power current (per mic)	14mA				

* This specification is valid for Mic 1-8 inputs if Microphone Level setting is selected

** This specification is valid for Line 1-8 inputs if Line Level setting is selected

Volume control table

Volume control	
Ring tone volume*	Audio gain value
0	0
1	-34.5 dB
70	0.0 dB
100	15.0 dB

* The ring tone volume, which is displayed on screen when using the TRC5 remote control, goes from 0 to 20.

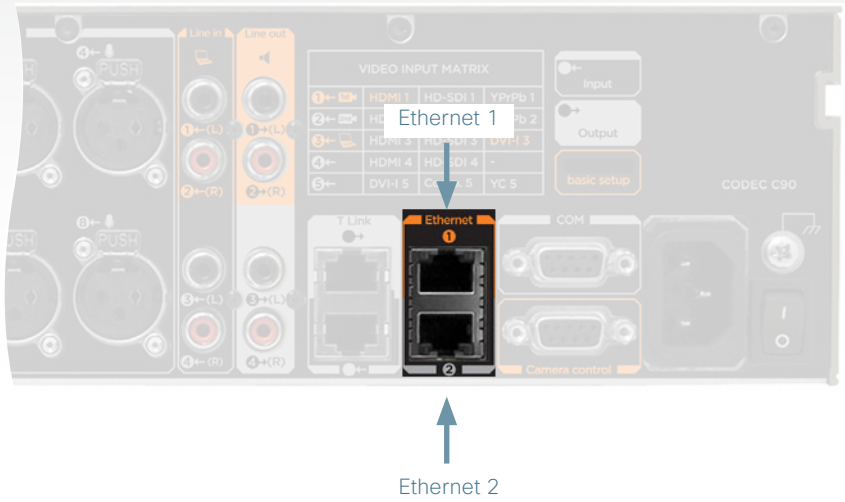
Network connectors

Ethernet interface

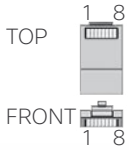
2 × Gigabit Ethernet LAN (RJ-45 Jack) interface (GbE).

Ethernet 1: Main connector for network connection

Ethernet 2: For direct pairing with the Cisco TelePresence Touch for C Series.



RJ-45 Connector pin-out



Wiring diagram
standard cable

1 ---------- 1
2 ---------- 2
3 ---------- 3
6 ---------- 6

COM port and Camera Control port

COM port

1 x COM (RS-232) data port for codec control and configuration through API commands.

Camera Control port

1 x Camera Control (RS-232) port for power and camera control (pan, tilt, zoom) using the VISCA™* protocol.

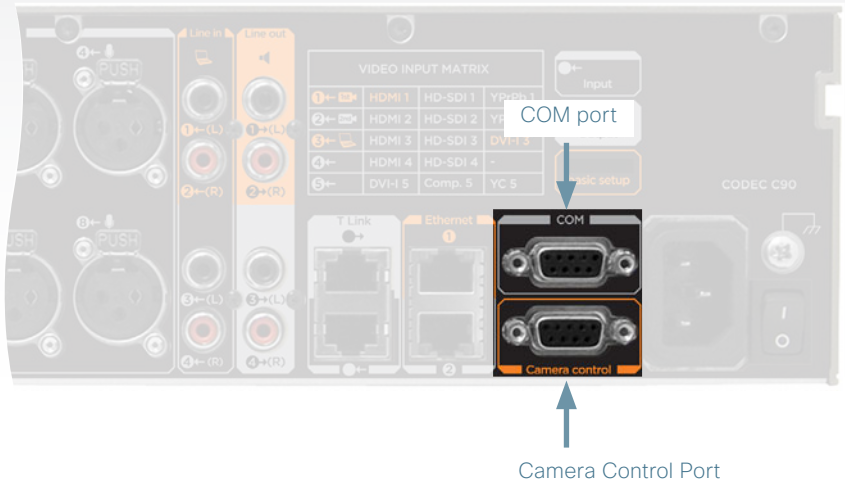
Main connector. The main camera is connected to the Camera Control port.

Power. Pin No. 4 on the Camera Control port provides 12 V DC / 1 A to the main camera.

If more than one camera is connected, only the first camera is powered from the codec. The additional cameras must be daisy chained by using a serial cable, and each will need an external power supply.

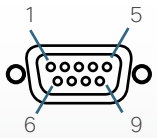
Additional cameras. For information about additional cameras, see the PrecisionHD Camera User Guide which is found on our web site, go to: ▶ http://www.cisco.com/go/telepresence/docs

*VISCA™ is a trademark of Sony Corporation



RS232 9 pin D-SUB pin-out

External view of socket



Pin-out–COM Port

Pin	Signal name	Direction
1	Carrier detect, CD	From DCE
2	Receive data, RXD	From DCE
3	Transmit data, TXD	To DCE
4	12 V / 1 A	To the main camera
5	Signal GND	
6	Data set ready, DSR	From DCE
7	Ready to send, RTS	To DCE
8	Clear to send, CTS	From DCE
9	Ring indicator, RI	From DCE

Pin-out–VISCA™ camera control RJ11, 8 pins shielded modular jack

Pin	Signal name
8	+12V (presence 2.8mA current source when connected in daisy chain)
7	GND
6	TXD (out)
5	NC (no connect)
4	NC (no connect)
3	RXD (in)
2	GND
1	+12V

Pin-out–Camera cable

Signal name	RJ-45 pin		D-SUB pin
+12V DC	1	Twisted pair	4
GND	2		5
RX	3	Twisted pair	2
TX	6		3
NC	4	Twisted pair	1
NC	5		6
GND	7	Twisted pair	5
+12V DC	8		4

Power

Power socket

Power Cord Socket.

Accepts 100-240V, 50/60Hz, 2.8A max.

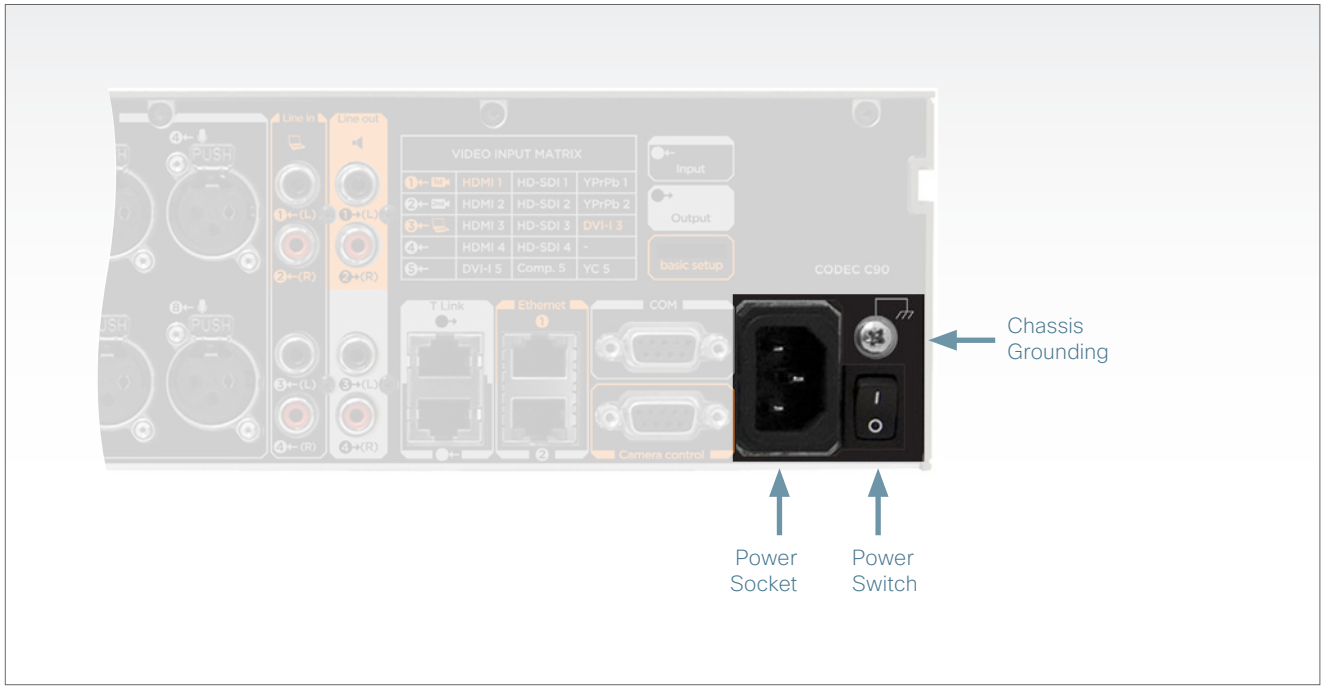
CAUTION! This equipment must be grounded.

Power switch

Power Switch (On/Off)

Chassis grounding

For grounding of the chassis



GPIO and other connectors

GPIO

1 × GPIO (General Purpose Input/Output)

6 pins Phoenix plug, having 4 ports for On/Off control, GND and +12V.

You can configure input/output integrations by using pre-defined behavior. Exposure of states and commands for external control requires external programming.

For information about the API commands, see the API Guide for the codec, go to: ▶ http://www.cisco.com/go/telepresence/docs

Usage information

- A contact closure between the GND and a GPIO port pin is detected as a low input signal.
- When used for voltage inputs, the GPIO port detects it as:
  - Low signal for voltages 0 - 1 VDC
  - High signal for voltages 2 - 12 VDC
- When used for outputs, the GPIO port acts as a switch to GND, and is rated for 500mA @ 48V DC. The +12V pin provides +12 VDC, and is capable of sourcing up to 500mA.
- The GND connector is a common ground for all pins in the GPIO port.

USB

1 × USB Host

1 × USB Device

For future use.

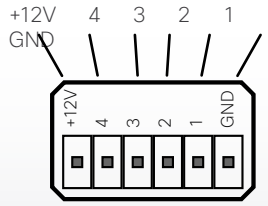
T Link

2 × T Link, RJ45 connector.

The cable for T Link out must be shielded.

For future use.

GPIO pin-out



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