Software version TC3.0
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The Physical Interface Guide

TANDBERG Codec C40

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.

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Chapter 1

Introduction

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Introduction

You may already be familiar with the system integrator guides for the TANDBERG C Series Codecs. To help you find the information you need, TANDBERG has split the information into smaller and more accessible parts listed on the right of this page.

The purpose of this document

The purpose of this document is to describe the physical interface of the TANDBERG Codec C40.

Disclaimers and Notices

The objective of this documentation is to provide the reader with assistance in using and configuring the product. The capabilities of TANDBERG products and other manufacturers' products change over time and so the required configuration may be different from that indicated here. If you have any suggestions for changes to this document, please feed them back to TANDBERG through your TANDBERG Authorized Service Representative.

If you need technical support, please contact your TANDBERG Authorized Service Representative.

The specifications for the product and the information in this Guide are subject to change at any time, without notice, by TANDBERG. Every effort has been made to supply complete and accurate information in this Guide; however, TANDBERG assumes no responsibility or liability for any errors or inaccuracies that may appear in this document.

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Products covered in this guide

- TANDBERG Codec C40

Other documents you might find useful

- ***Video conference room primer guide***
- ***Getting started guide*** for Profile Series, Codec C Series, Quick Set C20
- ***User Guide*** for Profile Series, Codec C Series and Quick Set C20
- ***Administrator guide*** for Profiles using Codec C20 and Quick Set C20
- ***Administrator guide*** for Profiles using Codec C60 and Codec C60/C40
- ***Administrator guide*** for Profiles using Codec C90 and Codec C90
- ***Camera user guide*** for PrecisionHD 1080p/720p
- ***API guides*** for Codec C90, C60, C40
- ***Physical interfaces guides*** for Codec C90, C60, C40
- **Legal and safety *information*** for Profile Series, Codec C Series and Quick Set C20

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Chapter 2

The physical interface of Codec C40

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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 TANDBERG Codec C40 provides great flexibility for the connection of audio and video equipment.

The illustration below shows the rear panel of the TANDBERG Codec C40.

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

Video sockets

The video input sockets comprise:

- 2 x HDMI
- 1 x DVI–I
- 1 x Composite or 1 x S–Video(YC)

The video output sockets comprise:

- 1 x HDMI
- 1 x DVI–I

Audio sockets

The audio input sockets comprise:

- 2 x XLR Female—Microphone/Line In
- 2 x RCA—Line In (1 Left, 2 Right)
- 1 x HDMI

The audio output sockets comprise:

- 2 x RCA—Left (SPDIF) and right
- 1 x HDMI

Other sockets

The other sockets comprise:

- Ethernet 1 and Ethernet 2*
- COM—Serial data port
- Camera control—Serial port for camera control
- Power socket
- Grounding—Chassis grounding
- Power On/Off switch
- USB Host*

* For future use

Codec C40 Rear Panel

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

Video sockets | USB | Audio sockets | Network interface sockets | COM Port, Camera Control | Power socket | Power switch

Video inputs

HDMI 1–2

2 x HDMI sockets, digital video input 1–2. There is audio input on HDMI 2 in.

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 camera.

DVI–I 3

1 x DVI–I sockets, digital/analog video input 3.

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

DVI–I is an integrated digital video interface (digital DVI–D and analog DVI–A)

Typical use. Two digital video inputs for PC presentations or used for the TANDBERG PrecisionHD Camera.

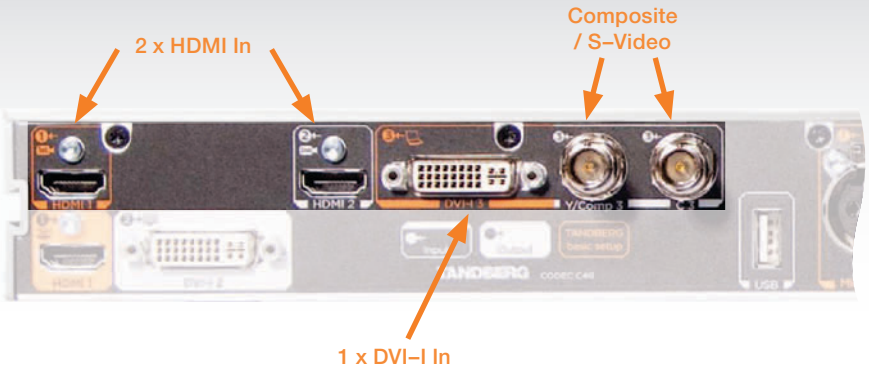
Composite 3 / S–Video (YC) 3

2 BNC sockets, analog video input 3.

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.

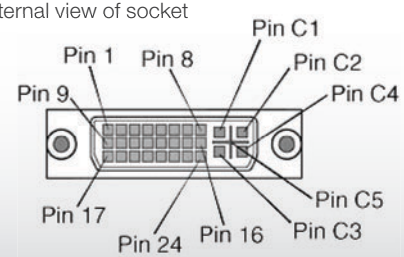
- S–Video 3: Connect to the Y/Comp 3 (luma) and C 3 (chroma) connectors
- Composite 3: Connect to Comp 3 connector

Typical use. Camera and DVD.



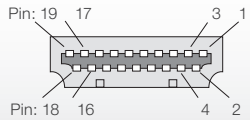
DVI–I pin–out

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+		

Levels

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 input formats

2 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)

1 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)

- 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)

Extended Display Identification Data (EDID)

1 x S–Video/Composite input, supported formats

- PAL/NTSC

Video outputs

HDMI 1

1 x HDMI socket, digital video and audio output 1.

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.

DVI–I 2

1 x DVI–I socket, digital/analog video output 2.

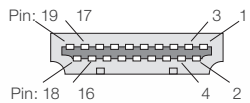
- DVI–D.
- DVI–A (Analog RGB / VGA).

DVI–I is an integrated digital video interface (digital DVI–D and analog DVI–A).

Typical use. Monitors.

HDMI pin–out

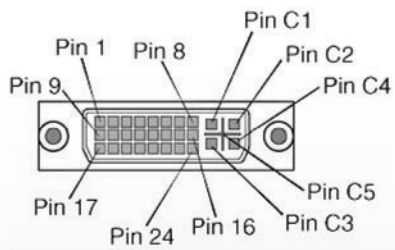
External view of socket



Refer to previous pages for pin–out scheme.

DVI–I pin–out

External view of socket



Video output formats

1 x HDMI and 1 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

Audio inputs

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

Microphone/Line In 1–2 (XLR)

2 x Balanced XLR sockets, audio input 1–2.

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

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

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

All Microphone/Line In 1–2 are equipped with acoustic echo canceller.

Use Microphone/Line In 1–2 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.

Line In 1–2 (RCA)

2 x RCA sockets, audio input 1–2

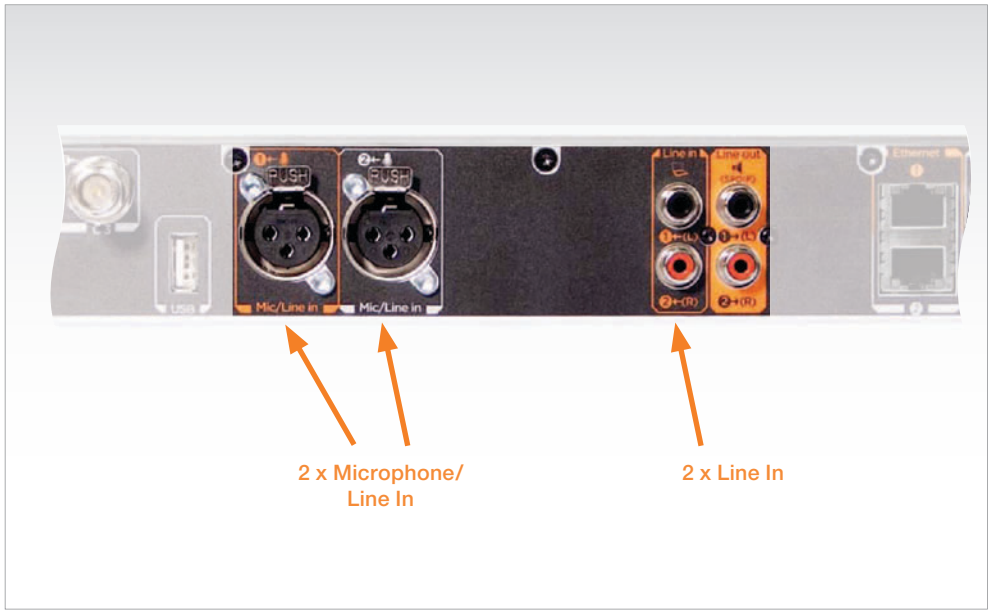
Audio Line In 1–2 are used when connecting to PC and to external playback devices, such as VCR's or DVD players.

Main connectors. The Line In 1 is the main connector 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
- Connect the right channel to Line In 2

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.



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)

RCA pin–out

External view of socket

RCA—Phono Plug (the Radio Corporation of America)

Audio HDMI in–/output

HDMI In 2

1 x HDMI connector with audio input.

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

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

HDMI Out 1

1 x HDMI connector, audio out 1

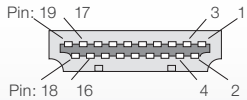
Use HDMI Out 1 to connect to a flat screen with speakers. HDMI 1 will provide stereo audio speaker signals at 48kHz.

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

HDMI 1. Audio from far end and PC.

HDMI pin–out

External view of socket



Please refer to previous pages for pin–out scheme.

Audio outputs

Line Out 1–2 (RCA)

2 x RCA sockets, audio output 1–2

Can be configured as two stereo pairs.

Main connector. 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 TANDBERG 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.

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 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.

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

Audio signal levels tables

Microphone Inputs 1 to 2 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 1–2 inputs if Microphone Level setting is selected.

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

Line outputs 1 to 2 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 1–2 **	*Line in 1–2*	*Line out 1–2*
Signal type	*Balanced*	*Unbalanced*	*Unbalanced*
Connector (codec)	XLR–F	Female RCA/phono	Female RCA/phono
Input impedance	8100 Ohm (pin 2–3)	10k Ohm	
Output impedance			100 Ohm
Max input level when set to Min input level	–18dBu/275mVpp	18dBu/17.4Vpp	
Max input level when set to Max input level	–42dBu/35mVpp	-6dBu/2.2Vpp	
Max output level when set to Min output level			-6dBu/2.2Vpp
Max output level when set to Max output level			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 1–2 inputs if Microphone 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

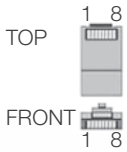
Ethernet interface

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

Ethernet 1: Main connector for network connection

Ethernet 2: For future use.

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.

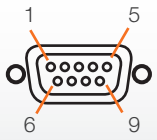
If more than one camera is connected, only the first camera is powered from the codec. The additional cameras must be daisy chained by using a serial cable, and each will need an external power supply.

Additional cameras. For information about additional cameras, go to the Cameras section later in this guide.

*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—TANDBERG 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.

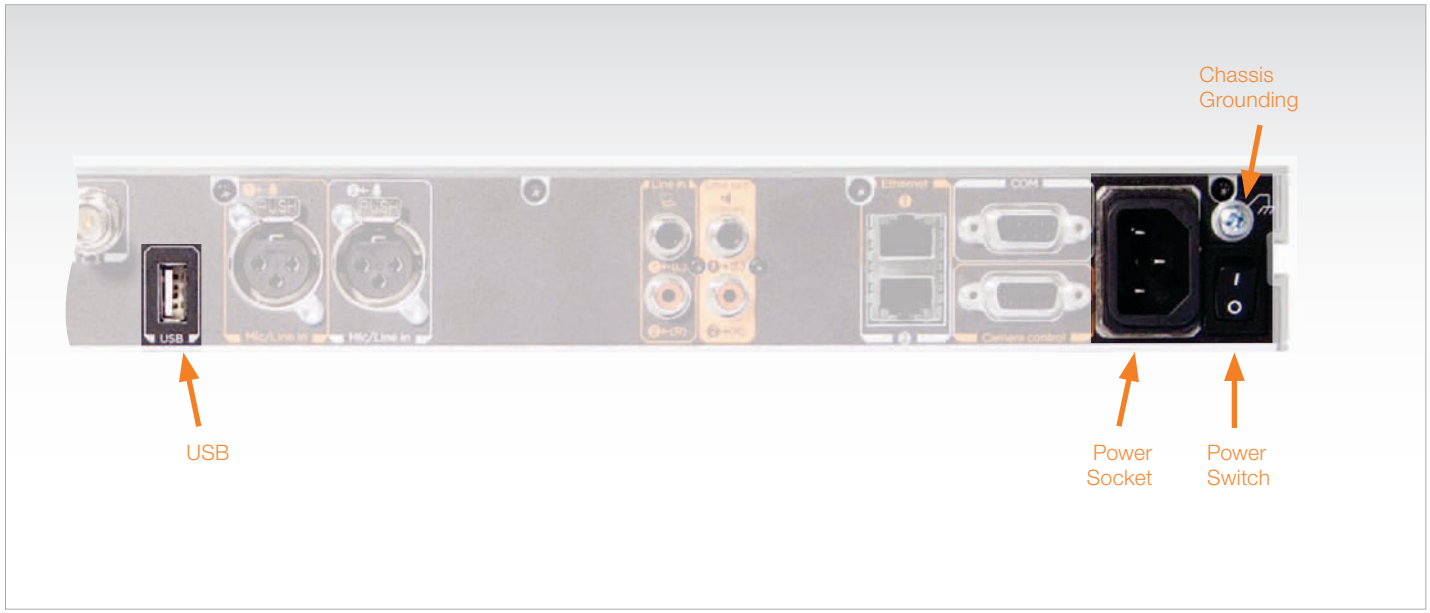
CAUTION! This equipment must be grounded.

Power switch

Power Switch (On/Off)

Chassis grounding

For grounding of the chassis



Other connectors

USB

1 × USB Host

For future use.

Chapter 3

Appendices

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Basic setup when connecting to Codec C40

The illustration shows you the basic setup when connecting the monitor, PC, camera, microphone, loudspeakers (if applicable), LAN and line voltage to the TANDBERG Codec C40.

INPUTS	OUTPUTS	TANDBERG Basic Setup
① ←	❶ →	The main connectors for TANDBERG basic setup are highlighted in orange.

Power Switch

After having connected the cables, you may turn the codec On.

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

Password protection

The system can be password protected in three ways:

- The Advanced menu can be password protected with a menu password.
- The Codec can be password protected with an administrator password.
- The Web interface is password protected with the same administrator password as for the codec. NOTE! Requires a reboot of the codec.

NOTE! When a new password has been defined make sure you save a copy of the password in a safe place. Contact your TANDBERG representative if you have forgotten the password.

Setting the codec administrator password

To define the administrator password on the codec:

1. Connect to the codec through the network or the serial data port, using a command line interface (ssh, telnet or scp)
2. Log in to the codec with user name (admin) and no password.
3. Run the following API command and enter a password:
   `xCommand SystemUnit AdminPassword Set Password: "****"`
4. The password format is a string with 0–255 characters.
5. **Reboot** the codec.

Password protection of the web interface

The web interface is password protected with the same user name and password as defined for the codec.

NOTE! To activate the administrator password on the web interface, after having defined or changed the administrator password, a reboot of the codec is required. Without a reboot the administrator password will only apply when you log in to the codec.

Log in to the codec or the web interface

- You can log in to the codec with the user name and password, either from a web interface or from a command line interface. You will need to enter both the user name and password.
- The user name is admin, and cannot be changed.

How to deactivate the administrator password

1. Connect to the codec through the network, using a command line interface (ssh, telnet or scp).
2. Login to the codec with the required user name (admin) and password.
3. Run the following API command with a blank password:
   `xCommand SystemUnit AdminPassword Set Password: ""`
4. **Reboot** the codec.

Setting the menu password

To define a password for the Advanced menus:

1. In the on–screen menu, go to ***Home*** > ***Settings*** > ***Advanced*** > ***Set menu password***.
2. The password is a string with 0–255 characters.
3. Enter the new password in the ***Set password*** menu
4. Press ***Save***.

Log in to the Advanced menu

When a password is set, the password is required to get access to the Advanced menu on screen.

How to change the menu password

1. To change the password, go to ***Home*** > ***Settings*** > ***Advanced*** > ***Set menu password***.
2. Enter the new password in the ***Set password*** menu
3. Press ***Save***.

How to deactivate the menu password

1. To deactivate the password, go to ***Home*** > ***Settings*** > ***Advanced*** > ***Set menu password***.
2. Leave the input field empty in the ***Set password*** menu.
3. Press ***Save*** to save the blank password. This will deactivate the menu password.

TANDBERG

U.S. HEADQUARTERS
TANDBERG
1212 Avenue of the Americas
24th Floor
New York, NY 10036
Telephone: +1 212 692 6500
Fax: +1 212 692 6501
Video: +1 212 692 6535
E–mail: tandberg@tandberg.com

EUROPEAN HEADQUARTERS
TANDBERG
Philip Pedersens vei 20
1366 Lysaker
Norway
Telephone: +47 67 125 125
Fax: +47 67 125 234
Video: +47 67 126 126
E–mail: tandberg@tandberg.com