Administrator guide

For TANDBERG Codec C90 and Profile 65” Dual using 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 the TANDBERG web site regularly for updated versions of this guide. Go to: http://www.tandberg.com/docs

<table>
<thead>
<tr>
<th>Table of Contents</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Introduction</strong></td>
</tr>
<tr>
<td>Introduction .........................</td>
</tr>
<tr>
<td>The purpose of this document ........</td>
</tr>
<tr>
<td>Disclaimers and Notices .............</td>
</tr>
<tr>
<td>Products covered in this guide ....</td>
</tr>
<tr>
<td>Other documents you might find useful</td>
</tr>
<tr>
<td>What's new in this version ...........</td>
</tr>
<tr>
<td>Software release notes ..............</td>
</tr>
<tr>
<td>User documentation ..................</td>
</tr>
<tr>
<td>New features and improvements ......</td>
</tr>
<tr>
<td>The Advanced configuration menu ....</td>
</tr>
<tr>
<td>TANDBERG Profile 65” Dual at a glance</td>
</tr>
<tr>
<td>TANDBERG Codec C90 at a glance ....</td>
</tr>
<tr>
<td><strong>Advanced configuration settings</strong></td>
</tr>
<tr>
<td>Description of the advanced configuration settings</td>
</tr>
<tr>
<td>The Audio settings ..................</td>
</tr>
<tr>
<td>The Conference settings .............</td>
</tr>
<tr>
<td>The GPIO settings ...................</td>
</tr>
<tr>
<td>The H323 settings ..................</td>
</tr>
<tr>
<td>The Network settings ...............</td>
</tr>
<tr>
<td>The NetworkServices settings .......</td>
</tr>
<tr>
<td>The Phonebook settings .............</td>
</tr>
<tr>
<td>The Provisioning settings ..........</td>
</tr>
<tr>
<td>The SerialPort settings ............</td>
</tr>
<tr>
<td>The SIP settings ...............</td>
</tr>
<tr>
<td>The Standby settings ...............</td>
</tr>
<tr>
<td>The SystemUnit settings ............</td>
</tr>
<tr>
<td>The Time settings ..................</td>
</tr>
<tr>
<td>The Video settings ................</td>
</tr>
<tr>
<td>The Experimental menu .............</td>
</tr>
<tr>
<td><strong>Password protection</strong></td>
</tr>
<tr>
<td>Password protection .................</td>
</tr>
<tr>
<td>Setting the codec administrator password</td>
</tr>
<tr>
<td>Setting the menu password ..........</td>
</tr>
<tr>
<td><strong>About monitors</strong></td>
</tr>
<tr>
<td>About monitors when you have a Codec C90</td>
</tr>
<tr>
<td>The main monitor .................</td>
</tr>
<tr>
<td>Connecting to HDMI 1 ............</td>
</tr>
<tr>
<td>Connecting to DVI-I 2, DVI-I 4, HDMI 3</td>
</tr>
<tr>
<td>Moving the OSD using the remote control</td>
</tr>
<tr>
<td>Moving the OSD using API commands</td>
</tr>
<tr>
<td>Dual monitors ....................</td>
</tr>
<tr>
<td>Dual monitor configuration ........</td>
</tr>
<tr>
<td><strong>Audio matters</strong></td>
</tr>
<tr>
<td>Dynamic audio API ..................</td>
</tr>
<tr>
<td>The equalizer ......................</td>
</tr>
<tr>
<td>The Audio Console application ....</td>
</tr>
<tr>
<td>The equalizer filter parameters ...</td>
</tr>
<tr>
<td>The equalizer IIR filter ..........</td>
</tr>
<tr>
<td>The filter types ..................</td>
</tr>
<tr>
<td>Microphone reinforcement ..........</td>
</tr>
<tr>
<td>Stereo .........................</td>
</tr>
<tr>
<td>Stereo in point to point call ......</td>
</tr>
<tr>
<td>Stereo in Multisite ...............</td>
</tr>
<tr>
<td>Examples of local stereo configuration</td>
</tr>
<tr>
<td><strong>Appendices</strong></td>
</tr>
<tr>
<td>Optimal Definition Profiles ..........</td>
</tr>
</tbody>
</table>
Chapter 1
Introduction
Introduction

You may already be familiar with the administrator guides for the Profile Series and Codec C Series. To help you find the information you need, TANDBERG has split the guides 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 provide you with information required to administrate your product at an advanced level.

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 Profile 65” Dual using C90
- TANDBERG Codec C90

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

Download the user documentation

Go to: ►http://www.tandberg.com/docs
What’s new in this version
The information on this page describes the highlights and main changes in the new version (TC3.1) for the C Series line of codecs. See the previous version of this guide for an overview of the news in the TC3.0 main release.

New features and improvements

Callway
Callway is the first low cost subscription-based service for video calls. It delivers high-definition video and voice communications across the internet, connecting you with anyone who is using a standards-based video device, landline or mobile phone. Read more about Callway here: http://www.tandberg.com/callway

NAT support
With NAT (Network Address Translation) support on H.323, the TANDBERG firewall traversal technology creates a secure path through the firewall barrier, and enables proper exchange of audio/video data when connected to an external video conferencing system (when the IP traffic goes through a NAT router).

FECC on SIP
Far End Camera Control (FECC) is now supported on SIP.

The Advanced configuration menu

New settings
Conference FarEndControl SignalCapability: <Off/On>
Conference MaxTransmitCallRate <64..6000>
Conference MaxReceiveCallRate <64..6000>
H323 NAT Mode: <Auto/Off/On>
H323 NAT Address: <S: 0, 64>
Phonebook Server Type <VCS/TMS/Callway>
Provisioning LoginName: <S: 0, 80>
Provisioning Password: <S: 0, 64>
Provisioning HttpMethod: <GET/POST>
Video OSD MyContactsExpanded: <Off/On>

Settings that have changed
OLD: Provisioning Mode: <Off/TMS>
NEW: Provisioning Mode: <Off/TMS/CallWay>
OLD: Provisioning ExternalManager Protocol: <Http/Https>
NEW: Provisioning ExternalManager Protocol: <HTTP/HTTPS>
Time Zone: Added the (Coordinated Universal Time)/GMT
SystemUnit MenuLanguage: Added the Danish and Dutch languages

Experimental settings
The Experimental settings can be used ‘as is’, and are not fully documented. NOTE! The Experimental settings WILL change.

Software release notes
For a complete overview of the news and changes, we recommend reading the TANDBERG TC Software Release Notes (TC3). Go to: ►http://www.tandberg.com/docs

User documentation
You may already be familiar with the user guides for the Profile Series and Codec C Series. To help you find the information you need, TANDBERG has split the guides into smaller and more accessible parts.

The Administrator Guide has been split into:
- Getting started guide
- Video conference room primer guide
- Camera user guide
- Administrator guide
- Legal and safety information guide

The System Integrator Guide has been split into:
- API guide for Codec C90
- Physical interfaces guide for Codec C90

The User Guides have been merged into one guide:
- User Guide for Profile Series and Codec C Series

The user documentation is available from our web site. Select your product from the drop down list to see an overview of the user documentation for that product.
Go to: ►http://www.tandberg.com/docs
TANDBERG Profile 65” Dual at a glance

Codec C90
- Full HD video
- High resolution data sharing
- Full HD Multisite
- Rich I/O capabilities

PrecisionHD 1080p
Full HD Camera designed for visual communication with:
- 12 x optical zoom
- Fast and precise pan, tilt and zoom

Dual monitor 65”
Full HD LCD Display

Audio module
Wide band audio module supporting:
- 20 kHz AAC-LD
- Full echo canceling
- Stereo

Audio amplifier
Optimized DNAM for TANDBERG Profile providing crystal clear and natural audio.

Microphones
3 x Microphones with cables

Remote control
- TANDBERG Remote Control TRC5 with 4 x AAA batteries

Foot stand
Floor standing foot plate
TANDBERG Codec C90 at a glance

The TANDBERG Codec C90 is used in telepresence and collaboration projects, having the ultimate collaboration engine with HD video & audio, tremendous power and the highest level of flexibility for any projects.

Design Features
- The best, most powerful codec available with the ultimate video and audio quality.
- 2U high, rack mountable, with special rack mounting solution included.
- Professional grade connectors.
- Unmatched quality and flexibility.
- Standards-compliant 1080p solution-compatible with standards-based video without losing features.

Application Features
- 1080p30 HD Individual Transcoding embedded Multisite.
- Collaborate on virtually anything with 5 simultaneous video inputs.
- HD Collaboration with 1080p30 or UXGA (UXGA ready and available with future software).
- Limitless integration possibilities.
- Ideal for telepresence and collaboration studios, boardrooms, auditoriums, education and tele-medicine applications.

Performance Features
- Optimal Definition up to 1080p.
- H.323/SIP up to 6 Mbps point-to-point; up to 10 Mbps total MultiSite bandwidth.
- Connect up to 12 HD sources and 8 microphones directly into the interface.
- Full Duplex Audio with High Quality Stereo Sound.
- Full APIs, see the API Guide for Codec C90.
- Takes advantage of the TANDBERG Total Solution with Management, Transcoded HD MultiSite™, Recording and Streaming, Firewall Traversal.

Integrator package

The integrator package of the TANDBERG Codec C90 comes with the TANDBERG PrecisionHD 1080p camera and two microphones and cables.
Chapter 2

Advanced configuration settings
Description of the advanced configuration settings

In the following pages you will find a complete list of the system settings which are configured from the Advanced configuration menu. Open the Home menu on screen and go to: Settings > Advanced > Advanced configuration. The examples show either the default value or an example of a value.

The Audio settings

Audio Input HDMI [3, 4] Level

Define the audio level of the HDMI input connector, in steps of 1dB.

See the Audio Level tables in the Physical Interfaces Guide for the codec for a complete overview of the menu values represented in dB.

Value space: <-24..0>

Range: Select a value from -24 to 0dB.

Example: Audio Input HDMI 3 Level: 0

Audio Input HDMI [3, 4] Mode

Determines whether or not the audio channels on the HDMI input should be enabled. The HDMI input 3 and 4 have two audio channels.

Value space: <On/Off>

On: Enable the audio channels on the HDMI input.

Off: Disable the audio channels on the HDMI input.

Example: Audio Input HDMI 3 Mode: On

Audio Input HDMI [3..4] VideoAssociation MuteOnInactiveVideo

Enable association of a video source to a HDMI audio input.

Value space: <On/Off>

On: A video source is associated, and the audio will be muted if the associated video source is not displayed.

Off: No video source is associated.

Example: Audio Input HDMI 3 VideoAssociation MuteOnInactiveVideo: Off

Audio Input HDMI [3..4] VideoAssociation VideoInputSource

Select the associated video input source.

Value space: <1/2/3/4/5>

Range: Select one of the five video input sources.

Example: Audio Input HDMI 3 VideoAssociation VideoInputSource: 1

Audio Input Line [1..4] Equalizer ID

Select the audio input line equalizer ID.

Value space: <1..8>

Range: Select EqualizerID 1 to 8.

Example: Audio Input Line 1 Equalizer ID: 1

Audio Input Line [1..4] Equalizer Mode

Set the audio input line equalizer mode.

Value space: <On/Off>

On: Enable the equalizer for the audio input line.

Off: No equalizer.

Example: Audio Input Line 1 Equalizer Mode: Off

Audio Input Line [1..4] VideoAssociation MuteOnInactiveVideo

Enable association of a video source to a Line audio input.

Value space: <On/Off>

On: A video source is associated, and the audio will be muted if the associated video source is not displayed.

Off: No video source is associated.

Example: Audio Input Line 1 VideoAssociation MuteOnInactiveVideo: Off

Audio Input Line [1..4] VideoAssociation VideoInputSource

Select the associated video input source.

Value space: <1/2/3/4/5>

Range: Select one of the five video input sources.

Example: Audio Input Line 1 VideoAssociation VideoInputSource: 1

Audio Input Line [1..4] Channel

Define whether the Audio Line input is a mono signal or part of a multichannel signal.

Value space: <Left/Right/Mono>

Left: The Audio Line input signal is the left channel of a stereo signal.

Right: The Audio Line input signal is the right channel of a stereo signal.

Mono: The Audio Line input signal is a mono signal.

Example: Audio Input 1 Channel: Left

The Audio settings, continued...
The Audio settings, cont...

Audio Input Line [1..4] Level
Define the audio level of the Line input connector, in steps of 1dB.
See the Audio Level tables in the Physical Interfaces Guide for the codec for a complete overview of the menu values represented in dB.
Value space: <0..24>
Range: Select a value from 0 to 24dB.
Example: Audio Input Line 1 Level: 10

Audio Input Line [1..4] Loop Suppression
The loop suppression functionality detects whether a delayed signal loop is present from an audio Line output to an audio Line input on the codec. If a loop is detected the unwanted feedback is suppressed.
NOTE! Only loops between line output 3 and line input 3, and between line output 4 and line input 4 are suppressible.
Value space: <On/Off>
On: Activate Loop Suppression.
Off: Deactivate Loop Suppression.
Example: Audio Input Line 3 Loop Suppression: On

Audio Input Line [1..4] Mode
Set the audio input line mode.
Value space: <On/Off>
On: Enable the Audio Line input.
Off: Disable the Audio Line input.
Example: Audio Input Line 1 Mode: On

Audio Input Microphone [1..8] EchoControl Mode
The echo canceller continuously adjusts itself to the audio characteristics of the room and compensate for any changes it detects in the audio environment. If the changes in the audio conditions are very significant the echo canceller may take a second or two to re-adjust.
Value space: <On/Off>
On: Echo Control is normally set to On to prevent the far end from hearing their own audio. Once selected, echo cancellation is active at all times.
Off: Echo Control should be switched Off if an external echo canceller or playback equipment is used.
Example: Audio Input Microphone 1 EchoControl Mode: On

Audio Input Microphone [1..8] EchoControl Noise Reduction
The system has a built-in noise reduction which reduces constant background noise (e.g. noise from air-conditioning systems, cooling fans etc.). In addition, a high pass filter (Humfilter) reduces very low frequency noise. NOTE! Requires the Echo Control Mode to be enabled for the microphone.
Value space: <On/Off>
On: The Noise Reduction should be enabled in the presence of low frequency noise.
Off: Turn off the Noise Reduction.
Example: Audio Input Microphone 1 EchoControl NoiseReduction: On

Audio Input Microphone [1..8] Equalizer ID
Select the audio input microphone equalizer ID.
Value space: <1..8>
Range: Select Equalizer ID 1 to 8.
Example: Audio Input Microphone 1 Equalizer ID: 1

Audio Input Microphone [1..8] Equalizer Mode
Set the audio input microphone equalizer mode.
Value space: <On/Off>
On: Enable the equalizer for the audio input microphone.
Off: No equalizer.
Example: Audio Input Microphone 1 Equalizer Mode: Off

Audio Input Microphone [1..8] Video Association Mute On Inactive Video
Enable association of a video source to a microphone audio input.
Value space: <On/Off>
On: A video source is associated, and the audio will be muted if the associated video source is not displayed.
Off: No video source is associated.
Example: Audio Input Microphone 1 Video Association Mute On Inactive Video: On

Audio Input Microphone [1..8] Video Association Video Input Source
Select the associated video input source.
Value space: <1/2/3/4/5>
Range: Select one of the five video input sources.
Example: Audio Input Microphone 1 Video Association Video Input Source: 1
The Audio settings, cont...

**Audio Input Microphone [1..8] Level**
Define the audio level of the Microphone input connector, in steps of 1dB.

See the Audio Level tables in the Physical Interfaces Guide for the codec for a complete overview of the menu values represented in dB.

Value space: <0..24>

Range: Select a value from 0 to 24dB.

Example: Audio Input Microphone 1 Level: 15

**Audio Input Microphone [1..8] Mode**
Set the audio input microphone mode.

Value space: <On/Off>

On: Enable the microphone connector.
Off: Disable the microphone connector.

Example: Audio Input Microphone 1 Mode: On

**Audio Input Microphone [1..8] Type**
The microphone connectors are intended for electret type microphones. The microphone connector can be set to line or microphone mode.

Value space: <Microphone/Line>

Microphone: Select Microphone when you have 48 V Phantom voltage and the pre-amplification is On.
Line: Select Line when you have a standard balanced line input. The phantom voltage and pre-amplification is Off.

Example: Audio Input Microphone 1 Type: Line

**Audio Output HDMI [1, 3] Level**
Define the output level of the HDMI output connector, in steps of 1dB.

See the Audio Level tables in the Physical Interfaces Guide for the codec for a complete overview of the menu values represented in dB.

Value space: <-24..0>

Range: Select a value from -24 to 0dB.

Example: Audio Output HDMI 1 Level: -10

**Audio Output HDMI [1, 3] Mode**
Determines whether or not the audio channel on the HDMI output connector should be enabled.

Value space: <On/Off>

On: Enable the audio channel on the HDMI output.
Off: Disable the audio channel on the HDMI output.

Example: Audio Output HDMI 1 Mode: On

**Audio Output Line [1..6] Channel**
Define whether the Audio Line output is a mono signal or part of a multichannel signal.

Value space: <Left/Right/Mono>

Left: The Audio Line output signal is the left channel of a stereo signal.
Right: The Audio Line output signal is the right channel of a stereo signal.
Mono: The Audio Line output signal is a mono signal.

Example: Audio Output Line 1 Channel: left

**Audio Output Line [1..6] Equalizer ID**
Select the audio output line equalizer ID.

Value space: <1..8>

Range: Select EqualizerID 1 to 8.

Example: Audio Output Line 1 Equalizer ID: 1

**Audio Output Line [1..6] Equalizer Mode**
Set the audio output line equalizer mode.

Value space: <On/Off>

On: Enable the equalizer for the audio output line.
Off: No equalizer.

Example: Audio Output Line 1 Equalizer Mode: Off

**Audio Output Line [1..6] Level**
Define the output level of the Audio Output Line connector, in steps of 1dB.

See the Audio Level tables in the Physical Interfaces Guide for the codec for a complete overview of the menu values represented in dB.

Value space: <-24..0>

Range: Select a value from -24 to 0dB.

Example: Audio Output Line 1 Level: -10
Audio Output Line 1..6 Mode
Set the audio output line mode.
Value space: <On/Off>
   On: Enable the Audio Line output.
   Off: Disable the Audio Line output.
Example: Audio Output Line 1 Mode: On

Audio Output Line [1, 3] Type
Determines if the Audio Line output connector is an analog or digital type output.
Value space: <Auto/SPDIF>
   Auto: If a TANDBERG Digital NAM is detected then SPDIF mode will be selected, otherwise analog mode will be selected.
   SPDIF: Set to SPDIF when you want the line output to be in digital mode.
Example: Audio Output Line 1 Type: Auto

Audio Output Line [2, 4, 5, 6] Type
Line output 2, 4, 5, 6 are dedicated analog outputs, hence type can be set to analog only.
Value space: <Analog>
   Analog: Can be set to analog only.
Example: Audio Output Line 2 Type: Analog

Audio SoundsAndAlerts KeyTones Mode
The system can produce a sound every time a key on the remote control is pressed.
Value space: <On/Off>
   On: There will be a sound indicator when pressing keys on the remote control.
   Off: The remote control Key Tones is switched off.
Example: Audio SoundsAndAlerts KeyTones Mode: Off

Audio SoundsAndAlerts RingVolume
Set the ring tone volume for an incoming call. The value goes in steps of 5 from 0 to 100 (from -34.5dB to 15dB). Volume 0 = Off.
Value space: <0..100>
   Range: Select a value from 0 to 100.
Example: Audio SoundsAndAlerts RingVolume: 50

Audio Volume
Set the volume on the loudspeaker. The value goes in steps of 5 from 0 to 100 (from -34.5dB to 15dB). Volume 0 = Off.
Value space: <0..100>
   Range: Select a value from 0 to 100.
Example: Audio Volume: 70

The Audio settings, cont...
The Camera settings

**Cameras PowerLine Frequency**
Applies to cameras supporting PowerLine frequency anti-flickering, i.e. TANDBERG PrecisionHD 1080p cameras.
Value space: <Auto/50Hz/60Hz>
- **Auto**: Enable power frequency auto detection in the camera.
- **50Hz/60Hz**: Set to 50Hz or 60Hz.

**Example:** Cameras PowerLine Frequency: Auto

**Cameras Camera [1..7] Brightness Mode**
Set the camera brightness mode.
Value space: <Auto/Manual>
- **Auto**: The camera brightness is automatically adjusted by the system.
- **Manual**: Enable manual control of the camera brightness, e.g. the level of the brightness level setting will be used for the camera.

**Example:** Cameras Camera 1 Brightness Mode: Auto

**Cameras Camera [1..7] Brightness Level**
Set the brightness level. NOTE! Requires the Camera Brightness Mode to be set to Manual.
Value space: <1..31>
- **Range**: Select a value from 1 to 31.

**Example:** Cameras Camera 1 Brightness Level: 1

**Cameras Camera [1..7] Whitebalance Mode**
Set the camera whitebalance mode.
Value space: <Auto/Manual>
- **Auto**: The camera will continuously adjust the whitebalance depending on the camera view.
- **Manual**: Enable manual control of the camera whitebalance, e.g. the level of the whitebalance level setting will be used for the camera.

**Example:** Cameras Camera 1 Whitebalance Mode: Auto

**Cameras Camera [1..7] Whitebalance Level**
Set the whitebalance level. NOTE! Requires the Camera Whitebalance Mode to be set to Manual.
Value space: <1..16>
- **Range**: Select a value from 1 to 16.

**Example:** Cameras Camera 1 Whitebalance Level: 1

**Cameras Camera [1..7] Focus Mode**
Set the camera focus mode.
Value space: <Auto/Manual>
- **Auto**: The focus is automatically adjusted by the system throughout the call. When moving the camera, the system will use auto focus for a few seconds to set the right focus of the new camera position. After a few seconds auto focus is turned off to prevent continuous focus adjustments of the camera.
- **Manual**: Turn the autofocus off and adjust the camera focus manually.

**Example:** Cameras Camera 1 Focus Mode: Auto

**Cameras Camera [1..7] Backlight**
The backlight functionality compensates for lights shining directly at the camera (usually the sun entering the window) to avoid a too dark image from the room.
Value space: <On/Off>
- **On**: Turn on the camera backlight.
- **Off**: Turn off the camera backlight.

**Example:** Cameras Camera 1 Backlight: Off

**Cameras Camera [1..7] Mirror**
With Mirror mode (horizontal flip) you can mirror the image on screen.
Value space: <Auto/On/Off>
- **Auto**: When the camera is placed upside down the image is automatically mirrored. Use this setting with cameras that can be mounted upside down, and that can auto detect that the camera is mounted upside down.
- **On**: See the selfview in mirror mode, e.g. the selfview is reversed and the experience of selfview is as seeing yourself in a mirror.
- **Off**: See the selfview in normal mode, e.g. the experience of selfview is as seeing yourself as other people see you.

**Example:** Cameras Camera 1 Mirror: Off
The Camera settings, cont...

Cameras Camera [1..7] Flip
With Flip mode (vertical flip) you can flip the image upside down.

Value space: <Auto/On/Off>

Auto: When the camera is placed upside down the image is automatically flipped upside down. Use this setting with cameras that can be mounted upside down, and that can auto detect that the camera is mounted upside down.

On: When enabled the video on screen is flipped. This setting is used with cameras that can be mounted upside down, but cannot auto detect that the camera is mounted upside down.

Off: Display the video on screen the normal way.

Example: Cameras Camera 1 Flip: Off

Cameras Camera [1..7] DHCP
Applies to cameras which supports DHCP. The TANDBERG PrecisionHD 1080p camera supports DHCP. The camera must be connected to a LAN. When set, the command enables support for SW upgrade of daisy chained cameras. It will enable the camera's DHCP function and force start of MAC and IP address retrieval. Remember to reset the DHCP when the camera is no longer connected to a LAN.

Value space: <On/Off>

On: Enable DHCP in the camera. The camera is automatically re-booted. After re-boot the DHCP is started and the IP address will be retrieved. Run the command "xStatus Camera" for result.

Off: Disable DHCP in the camera. NOTE! Set to Off when the camera is not connected to a LAN.

Example: Cameras Camera 1 DHCP: Off

Cameras Camera [1..7] Gamma Mode
Applies to cameras which supports Gamma mode. The Gamma Mode setting enables for gamma corrections. Gamma describes the nonlinear relationship between image pixels and monitor brightness. The TANDBERG PrecisionHD 720p camera supports Gamma Mode. Not supported on The TANDBERG PrecisionHD 1080p camera.

Value space: <Auto/Manual>

Auto: Auto is the default and the recommended setting.

Manual: In severe light conditions, you may switch mode to manual and specify explicitly which gamma table to use by setting the Gamma Level.

Example: Cameras Camera 1 Gamma Mode: Auto

Cameras Camera [1..7] Gamma Level
By setting the Gamma Level you can select which gamma correction table to use. This setting may be useful in difficult lighting conditions, where changes to the brightness setting does not provide satisfactory results. NOTE! Requires the Camera Gamma Mode to be set to Manual.

Value space: <0..7>

Range: Select a value from 0 to 7.

Example: Cameras Camera 1 Gamma Level: 0

Cameras Camera [1..7] IrSensor
The IR sensor LED is located in the front of the camera and flickers when the IR sensor is activated from the remote control. Both the TANDBERG camera and codec has an IR sensor. You would normally choose just one of them to be active at a time.

Value space: <On/Off>

On: Enable the IR sensor on the camera.

Off: Disable the IR sensor on the camera.

Example: Cameras Camera 1 IrSensor: On
The Conference settings

Conference [1..1]IncomingMultisiteCall Mode
Set the incoming Multisite call mode.
Value space: <Allow/Deny>
- Allow: Accept incoming calls to an already active call/conference. The incoming call will be added to the MCU conference.
- Deny: The system will not accept incoming calls when you are in a call. The calling side will receive a busy signal.
Example: Conference 1 IncomingMultisiteCall Mode: Allow

Conference [1..1] AutoAnswer Mode
Set the AutoAnswer mode.
Value space: <On/Off>
- On: Enable AutoAnswer to let the system automatically answer all incoming calls.
- Off: The incoming calls must be answered manually by pressing the OK key or the green Call key on the remote control.
Example: Conference 1 AutoAnswer Mode: Off

Conference [1..1] AutoAnswer Mute
The AutoAnswer Mute setting determines whether the microphone is muted when an incoming call is automatically answered. NOTE! Requires the AutoAnswer Mode to be enabled.
Value space: <On/Off>
- On: The incoming call will be muted when automatically answered.
- Off: The incoming call will not be muted.
Example: Conference 1 AutoAnswer Mute: Off

Conference [1..1] AutoAnswer Delay
Define how long (in seconds) an incoming call has to wait before it is answered automatically by the system. NOTE! Requires the AutoAnswer Mode to be enabled.
Value space: <0..50>
- Range: 0-50 seconds
Example: Conference 1 AutoAnswer Delay: 0

Conference [1..1] MicUnmuteOnDisconnect
The MicUnmuteOnDisconnect setting determines if the microphones should be automatically unmuted when all calls are disconnected. In a meeting room or other shared resource this could be done to prepare the system for the next user.
Value space: <On/Off>
- On: Un-mute the microphones after the call is disconnected.
- Off: If muted, let the microphones remain muted after the call is disconnected.
Example: Conference 1 MicUnmuteOnDisconnect: On

Conference [1..1] DoNotDisturb Mode
The Do Not Disturb setting determines whether or not there should be an alert on incoming calls.
Value space: <On/Off>
- On: All incoming calls will be rejected, with no alert. The calling side will receive a busy signal when trying to call the codec. A message will display on screen, telling that Do not disturb is turned on, together with an option to turn off the Do not disturb. When turning off the Do not disturb mode you will see a list of the calls that have been rejected.
- Off: The incoming calls will be alerted.
Example: DoNotDisturb Mode: Off

Conference [1..1] FarEndControl Mode
Lets you decide if the remote side (far end) should be allowed to select your video sources and control your local camera (pan, tilt, zoom).
Value space: <On/Off>
- On: Allows the far end to be able to select your video sources and control your local camera (pan, tilt, zoom). You will still be able to control your camera and select your video sources as normal.
- Off: Do not allow the far end to select your video sources or to control your local camera (pan, tilt, zoom).
Example: Conference 1 FarEndControl Mode: On

Conference [1..1] FarEndControl SignalCapability
Set the far end control (H.224) signal capability mode.
Value space: <On/Off>
- On: Enable the far end control signal capability.
- Off: Disable the far end control signal capability.
Example: Conference 1 FarEndControl SignalCapability: On
Conference [1..1] Encryption Mode
Set the conference encryption mode. A padlock with the text “Encryption On” or “Encryption Off” displays on screen, for a few seconds, when the conference starts.

Value space: <BestEffort/On/Off>
- **BestEffort**: The system will use encryption whenever possible.
  - In Point to point calls: If the far end system supports encryption (AES-128), the call will be encrypted. If not, the call will proceed without encryption.
  - In MultiSite calls: In order to have encrypted MultiSite conferences, all sites must support encryption. If not, the conference will be unencrypted.
- **On**: The system will only allow calls that are encrypted.
- **Off**: The system will not use encryption.

**Example:** Conference 1 Encryption Mode: BestEffort

Conference [1..1] DefaultCall Protocol
Set the Default Call Protocol to be used when placing calls from the system.

Value space: <H323/SIP>
- **H.323**: Select H.323 to ensure that calls are set up as H.323 calls.
- **SIP**: Select SIP to ensure that calls are set up as SIP calls.

**Example:** Conference 1 DefaultCall Protocol: H323

Conference [1..1] DefaultCall Rate
Set the Default Call Rate to be used when placing calls from the system.

Value space: <64..6000>
- **Range**: 64-6000kbps

**Example:** Conference 1 DefaultCall Rate: 768

Conference [1..1] MaxTransmitCallRate
Specify the maximum transmit call rate to be used when placing or receiving calls.

Value space: <64..6000>
- **Range**: 64-6000kbps

**Example:** Conference 1 MaxTransmitCallRate: 6000

Conference [1..1] MaxReceiveCallRate
Specify the maximum receive call rate to be used when placing or receiving calls.

Value space: <64..6000>
- **Range**: 64-6000kbps

**Example:** Conference 1 MaxReceiveCallRate: 6000

Conference [1..1] VideoBandwidth Mode
Set the conference video bandwidth mode.

Value space: <Dynamic/Static>
- **Dynamic**: The available transmit bandwidth for the video channels are distributed among the currently active channels. If there is no presentation, the main video channels will use the bandwidth of the presentation channel.
- **Static**: The available transmit bandwidth is assigned to each video channel, even if it is not active.

**Example:** Conference 1 VideoBandwidth Mode: Dynamic

Conference [1..1] VideoBandwidth MainChannel Weight
The available transmit video bandwidth is distributed on the main channel and presentation channel according to “MainChannel Weight” and “PresentationChannel Weight”. If the main channel weight is 2 and the presentation channel weight is 1, then the main channel will use twice as much bandwidth as the presentation channel.

Value space: <1..10>
- **Range**: Select a value from 1 to 10.

**Example:** Conference 1 VideoBandwidth MainChannel Weight: 5

Conference [1..1] VideoBandwidth PresentationChannel Weight
The available transmit video bandwidth is distributed on the main channel and presentation channel according to “MainChannel Weight” and “PresentationChannel Weight”. If the main channel weight is 2 and the presentation channel weight is 1, then the main channel will use twice as much bandwidth as the presentation channel.

Value space: <1..10>
- **Range**: Select a value from 1 to 10.

**Example:** Conference 1 VideoBandwidth PresentationChannel Weight: 5
The GPIO settings

**GPIO Pin [1..4] Mode**

The four GPIO pins are configured individually. The state can be retrieved by “xStatus GPIO Pin [1..4] State”. The default pin state is High (+12V). When activated as output, they are set to 0V. To activate them as input, they must be pulled down to 0V.

Value space: `<InputNoAction/OutputManualState/OutputInCall/OutputMicrophonesMuted/OutputPresentationOn/OutputAllCallsEncrypted/InputMuteMicrophones>`

- **InputNoAction**: The pin state can be set, but no operation is performed.
- **OutputManualState**: The pin state can be set by “xCommand GPIO ManualState Set PinX: <High/Low>” (to +12V or 0V, respectively).
- **OutputInCall**: The pin is activated when in call, deactivated when not in call.
- **OutputMicrophonesMuted**: The pin is activated when microphones are muted, deactivated when not muted.
- **OutputPresentationOn**: The pin is activated when presentation is active, deactivated when presentation is not active.
- **OutputAllCallsEncrypted**: The pin is activated when all calls are encrypted, deactivated when one or more calls are not encrypted.
- **InputMuteMicrophones**: When the pin is activated (0V), the microphones will be muted. When deactivated (+12V), the microphones are unmuted.

**Example**: GPIO Pin 1 Mode: InputNoAction

The H323 settings

**H323 NAT Mode**

The TANDBERG firewall traversal technology creates a secure path through the firewall barrier, and enables proper exchange of audio/video data when connected to an external video conferencing system (when the IP traffic goes through a NAT router). **NOTE!** NAT does not work in conjunction with gatekeepers.

Value space: `<Auto/On/Off>

- **Auto**: The system will try to determine if the “NAT Address” or the real IP-address should be used within signalling. This is done to make it possible to place calls to endpoints on the LAN as well as endpoints on the WAN.
- **On**: The system will signal the configured “NAT Address” in place of its own IP-address within Q.931 and H.245. The NAT Server Address will be shown in the startup-menu as: “My IP Address: 10.0.2.1”.
- **Off**: The system will signal the real IP Address.

**Example**: H323 NAT Mode: Off

**H323 NAT Address**

Enter the external/global IP-address to the router with NAT support. Packets sent to the router will then be routed to the system.

In the router, the following ports must be routed to the system’s IP-address:

- * Port 1720
- * Port 5555-5574
- * Port 2326-2485

Value space: `<S: 0, 64>

Format: String with a maximum of 64 characters.

**Example**: H323 NAT Address: “”

**H323 Profile [1..1] Authentication Mode**

Set the authenticatin mode for the H.323 profile.

Value space: `<On/Off`

- **On**: If the H.323 Gatekeeper Authentication Mode is set to On and a H.323 Gatekeeper indicates that it requires authentication, the system will try to authenticate itself to the gatekeeper. **NOTE!** Requires the Authentication LoginName and Authentication Password to be defined on both the codec and the Gatekeeper.
- **Off**: If the H.323 Gatekeeper Authentication Mode is set to Off the system will not try to authenticate itself to a H.323 Gatekeeper, but will still try a normal registration.

**Example**: H323 Profile 1 Authentication Mode: Off
The H.323 settings, cont...

**H.323 Profile [1..1] Authentication LoginName**

The system sends the Authentication Login Name and the Authentication Password to a H.323 Gatekeeper for authentication. The authentication is a one way authentication from the codec to the H.323 Gatekeeper, i.e. the system is authenticated to the gatekeeper. If the H.323 Gatekeeper indicates that no authentication is required, the system will still try to register. NOTE! Requires the H.323 Gatekeeper Authentication Mode to be enabled.

Value space: <S: 0, 50>

*Format:* String with a maximum of 50 characters.

**Example:** H323 Profile 1 Authentication LoginName: ""

---

**H.323 Profile [1..1] Authentication Password**

The system sends the Authentication Login Name and the Authentication Password to a H.323 Gatekeeper for authentication. The authentication is a one way authentication from the codec to the H.323 Gatekeeper, i.e. the system is authenticated to the gatekeeper. If the H.323 Gatekeeper indicates that no authentication is required, the system will still try to register. NOTE! Requires the H.323 Gatekeeper Authentication Mode to be enabled.

Value space: <S: 0, 50>

*Format:* String with a maximum of 50 characters.

**Example:** H323 Profile 1 Authentication Password:

---

**H.323 Profile [1..1] CallSetup Mode**

The H.323 Call Setup Mode defines whether to use a Gatekeeper or Direct calling when establishing H.323 calls. NOTE! Direct H.323 calls can be made even though the H.323 Call Setup Mode is set to Gatekeeper.

Value space: <Direct/Gatekeeper>

*Direct:* An IP-address must be used when dialing in order to make the H323 call.

*Gatekeeper:* The system will use a Gatekeeper to make a H.323 call. When selecting this option the H323 Profile Gatekeeper Address and H323 Profile Gatekeeper Discovery settings must also be configured.

**Example:** H323 Profile 1 CallSetup Mode: Gatekeeper

---

**H.323 Profile [1..1] Gatekeeper Discovery**

Determines how the system shall register to a H.323 Gatekeeper.

Value space: <Manual/Auto>

*Manual:* The system will use a specific Gatekeeper identified by the Gatekeeper’s IP-address.

*Auto:* The system will automatically try to register to any available Gatekeeper. If a Gatekeeper responds to the request sent from the codec within 30 seconds this specific Gatekeeper will be used. This requires that the Gatekeeper is in auto discovery mode as well. If no Gatekeeper responds, the system will not use a Gatekeeper for making H.323 calls and hence an IP-address must be specified manually.

**Example:** H323 Profile 1 Gatekeeper Discovery: Manual

---

**H.323 Profile [1..1] Gatekeeper Address**

Enter the IP address of the Gatekeeper. NOTE! Requires the H.323 Call Setup Mode to be set to Gatekeeper and the Gatekeeper Discovery to be set to Manual.

Value space: <S: 0, 255>

*Format:* Only the valid IP address format is accepted. An IP address that contains letters (192.a.2.0) or unvalid IP addresses (192.0.1234.0) will be rejected.

**Example:** H323 Profile 1 Gatekeeper Address: "192.0.2.0"

---

**H.323 Profile [1..1] H323Alias E164**

The H.323 Alias E.164 defines the address of the system, according to the numbering plan implemented in the H.323 Gatekeeper. The E.164 alias is equivalent to a telephone number, sometimes combined with access codes.

Value space: <S: 0, 30>

*Format:* Compact string with a maximum of 30 characters. Valid characters are 0–9, *, and #.

**Example:** H323 Profile 1 H323Alias E164: "90550092"

---

**H.323 Profile [1..1] H323Alias ID**

Lets you specify the H.323 Alias ID which is used to address the system on a H.323 Gatekeeper and will be displayed in the call lists. Example: "firstname.surname@company.com", “My H.323 Alias ID”

Value space: <S: 0, 49>

*Format:* String with a maximum of 49 characters

**Example:** H323 Profile 1 H323Alias ID: "firstname.lastname@company.com"
Network settings

**Network [1..1] DNS Domain Name**
DNS Domain Name is the default domain name suffix which is added to unqualified names.

Example: If the DNS Domain Name is “company.com” and the name to lookup is “MyVideoSystem”, this will result in the DNS lookup “MyVideoSystem.company.com”.

Value space: <S: 0, 64>

Format: String with a maximum of 64 characters.

Example: Network 1 DNS Domain Name: “”

**Network [1..1] DNS Server [1..5] Address**
Define the network addresses for DNS servers. Up to 5 addresses may be specified. If the network addresses are unknown, contact your administrator or Internet Service Provider.

Value space: <S: 0, 64>

Format: String with a maximum of 64 characters.

Example: Network 1 DNS Server 1 Address: “”

**Network [1..1] Assignment**
Define whether to use DHCP or Static IP assignment. NOTE! Changes to this setting requires a restart of the codec.

Value space: <Static/DHCP>

Static: When set to Static the ports are given within a static predefined range [5555–6555].

Dynamic: The system will allocate which ports to use when opening a TCP connection. The reason for doing this is to avoid using the same ports for subsequent calls, as some firewalls consider this as a sign of attack. When Dynamic is selected, the H.323 ports used are from 11000 to 20999. Once 20999 is reached they restart again at 11000. For RTP and RTCP media data, the system is using UDP ports in the range 2326 to 2487. Each media channel is using two adjacent ports, ie 2330 and 2331 for RTP and RTCP respectively. The ports are automatically selected by the system within the given range. Firewall administrators should not try to deduce which ports are used when, as the allocation schema within the mentioned range may change without any further notice.

Example: H323 Profile 1 PortAllocation: Dynamic

**Network [1..1] IPv4 Address**
Define the static IP network address for the system. Only applicable if the Network Assignment is set to Static.

Value space: <S: 0, 64>

Format: Only the valid IP address format is accepted. An IP address that contains letters (192.a.2.0) or unvalid IP addresses (192.0.1234.0) will be rejected.

Example: Network 1 IPv4 Address: “192.0.2.0”

---

The H323 settings, cont...

**H323 Profile [1..1] PortAllocation**
The H.323 Port Allocation setting affects the H.245 port numbers used for H.323 call signalling.

Value space: <Dynamic/Static>

Dynamic: The system will allocate which ports to use when opening a TCP connection. The reason for doing this is to avoid using the same ports for subsequent calls, as some firewalls consider this as a sign of attack. When Dynamic is selected, the H.323 ports used are from 11000 to 20999. Once 20999 is reached they restart again at 11000. For RTP and RTCP media data, the system is using UDP ports in the range 2326 to 2487. Each media channel is using two adjacent ports, ie 2330 and 2331 for RTP and RTCP respectively. The ports are automatically selected by the system within the given range. Firewall administrators should not try to deduce which ports are used when, as the allocation schema within the mentioned range may change without any further notice.

Static: When set to Static the ports are given within a static predefined range [5555–6555].

Example: H323 Profile 1 PortAllocation: Dynamic
Network [1..1] IPv4 Gateway

Define the IP network gateway. Only applicable if the Network Assignment is set to Static.

Value space: <S: 0, 64>

Format: Compact string with a maximum of 64 characters.

Example: Network 1 IPv4 Gateway: "192.0.2.0"

Network [1..1] IPv4 SubnetMask

Define the IP network subnet mask. Only applicable if the Network Assignment is set to Static.

Value space: <S: 0, 64>

Format: Compact string with a maximum of 64 characters.

Example: Network 1 IPv4 SubnetMask: "255.255.255.0"

Network [1..1] IPv4 QoS Mode

The QoS (Quality of Service) is a method which handles the priority of audio, video and data in the network. The QoS settings must be supported by the infrastructure. DiffServ (Differentiated Services) is a computer networking architecture that specifies a simple, scalable and coarse-grained mechanism for classifying, managing network traffic and providing QoS priorities on modern IP networks.

Value space: <Off/Diffserv>

Off: No QoS method is used.

Diffserv: When you set the QoS Mode to Diffserv you must configure the Diffserv sub menu settings (Audio, Data, Signalling and Video).

Example: Network 1 IPv4 QoS Mode: diffserv

Network [1..1] IPv4 QoS Diffserv Audio

The DiffServ Audio setting defines which priority Audio packets should have in an IP network. Enter a priority, which ranges from 0 to 63 for the packets. The higher the number, the higher the priority. These priorities might be overridden when packets are leaving the network controlled by the local network administrator. NOTE! Requires the Network IPv4 QoS Mode to be set to Diffserv.

Value space: <0..63>

Audio: A recommended value is DiffServ Code Point (DSCP) AF41, which equals the value 34. If in doubt, contact your network administrator.

Example: Network 1 IPv4 QoS Diffserv Audio: 0

Network [1..1] IPv4 QoS Diffserv Data

The DiffServ Data setting defines which priority Data packets should have in an IP network. Enter a priority, which ranges from 0 to 63 for the packets. The higher the number, the higher the priority. These priorities might be overridden when packets are leaving the network controlled by the local network administrator. NOTE! Requires the Network IPv4 QoS Mode to be set to Diffserv.

Value space: <0..63>

Data: A recommended value is DiffServ Code Point (DSCP) AF23, which equals the value 22. If in doubt, contact your network administrator.

Example: Network 1 IPv4 QoS Diffserv Data: 0

Network [1..1] IPv4 QoS Diffserv Signalling

The DiffServ Signalling setting defines which priority Signalling packets should have in an IP network. Enter a priority, which ranges from 0 to 63 for the packets. The higher the number, the higher the priority. These priorities might be overridden when packets are leaving the network controlled by the local network administrator. NOTE! Requires the Network IPv4 QoS Mode to be set to Diffserv.

Value space: <0..63>

Signalling: A recommended value is DiffServ Code Point (DSCP) AF31, which equals the value 26. If in doubt, contact your network administrator.

Example: Network 1 IPv4 QoS Diffserv Signalling: 0

Network [1..1] IPv4 QoS Diffserv Video

The DiffServ Video setting defines which priority Video packets should have in an IP network. Enter a priority, which ranges from 0 to 63 for the packets. The higher the number, the higher the priority. These priorities might be overridden when packets are leaving the network controlled by the local network administrator. NOTE! Requires the Network IPv4 QoS Mode to be set to Diffserv.

Value space: <0..63>

Video: A recommended value is DiffServ Code Point (DSCP) AF41, which equals the value 34. If in doubt, contact your network administrator.

Example: Network 1 IPv4 QoS Diffserv Video: 0

Network [1..1] IEEE8021X Mode

The system can be connected to an IEEE 802.1X LAN network, with a port-based network access control that is used to provide authenticated network access for Ethernet networks.

Value space: <On/Off>

On: The 802.1X authentication is enabled.

Off: The 802.1X authentication is disabled (default).

Example: Network 1 IEEE8021X Mode: Off
Network [1..1] IEEE8021X Identity
The 802.1X Identity is the user name needed for 802.1X authentication.
Value space: <S: 0, 64>
Format: String with a maximum of 64 characters.
Example: Network 1 IEEE8021X Identity: ""

Network [1..1] IEEE8021X Password
The 802.1X Password is the password needed for 802.1X authentication.
Value space: <S: 0, 32>
Format: String with a maximum of 32 characters.
Example: Network 1 IEEE8021X Password: "****"

Network [1..1] IEEE8021X AnonymousIdentity
The 802.1X Anonymous ID string is to be used as unencrypted identity with EAP (Extensible Authentication Protocol) types that support different tunneled identity, like EAP-PEAP and EAP-TTLS. If set, the anonymous ID will be used for the initial (unencrypted) EAP Identity Request.
Value space: <S: 0, 64>
Format: String with a maximum of 64 characters.
Example: Network 1 IEEE8021X AnonymousIdentity: ""

Network [1..1] IEEE8021X Eap Md5
Set the Md5 (Message-Digest Algorithm 5) mode. This is a Challenge Handshake Authentication Protocol that relies on a shared secret. Md5 is a Weak security.
Value space: <On/Off>
On: The EAP-MD5 protocol is enabled (default).
Off: The EAP-MD5 protocol is disabled.
Example: Network 1 IEEE8021X Eap Md5: On

Network [1..1] IEEE8021X Eap Peap
Set the Peap (Protected Extensible Authentication Protocol) mode. Authenticates LAN clients without the need for client certificates. Developed by Microsoft, Cisco and RSA Security.
Value space: <On/Off>
On: The EAP-PEAP protocol is enabled (default).
Off: The EAP-PEAP protocol is disabled.
Example: Network 1 IEEE8021X Eap Peap: On

Network [1..1] IEEE8021X Eap TTLS
Set the TTLS (Tunneled Transport Layer Security) mode. Authenticates LAN clients without the need for client certificates. Developed by Funk Software and Certicom. Usually supported by Agere Systems, Proxim and Avaya.
Value space: <On/Off>
On: The EAP-TTLS protocol is enabled (default).
Off: The EAP-TTLS protocol is disabled.
Example: Network 1 IEEE8021X Eap TTLS: On

Network [1..1] MTU
Set the Ethernet MTU (Maximum Transmission Unit).
Value space: <400..1500>
Range: Select a value from 400 to 1500bytes.
Example: Network 1 MTU: 1500

Network [1..1] Speed
Set the Ethernet link speed.
Value space: <Auto/10half/10full/100half/100full/1000full>
Auto: Autonegotiate link speed.
10half: Force link to 10Mbps half-duplex.
10full: Force link to 10Mbps full-duplex.
100half: Force link to 100Mbps half-duplex.
100full: Force link to 100Mbps full-duplex.
1000full: Force link to 1Gbps full-duplex.
Example: Network 1 Speed: Auto

Network [1..1] TrafficControl Mode
Set the network traffic control mode to decide how to control the the video packets transmission speed.
Value space: <On/Off>
On: Transmit video packets at maximum 20Mbps. Can be used to smooth out bursts in the outgoing network traffic.
Off: Transmit video packets at link speed.
Example: Network 1 TrafficControl: On
The Network settings, cont...

**Network [1..1] VLAN Voice Mode**
Set the VLAN voice mode.

Value space: Tagged/Untagged
- **Tagged**: The voice packets in the VLAN network are tagged with VlanId and Priority.
- **Untagged**: The voice packets in the VLAN network are untagged.

Example: Network 1 VLAN Voice Mode: Untagged

**Network [1..1] VLAN Voice VlanId**
Set the VLAN voice ID.

Value space: <0..4096>
- **Range**: Select a value from 0 to 4096.

Example: Network 1 VLAN Voice VlanId: 0

**Network [1..1] VLAN Voice Priority**
Set the VLAN voice priority.

Value space: <0..7>
- **Range**: Select a value from 0 to 7.

Example: Network 1 VLAN Voice Priority: 0

The NetworkServices settings

**NetworkServices H323 Mode**
Determines whether the system should be able to place and receive H.323 calls. NOTE! Requires a restart of the codec.

Value space: On/Off
- **On**: Enable the possibility to place and receive H.323 calls (default).
- **Off**: Disable the possibility to place and receive H.323 calls.

Example: NetworkServices H323 Mode: On

**NetworkServices HTTP Mode**
Set the HTTP mode to enable/disable access to the system through a web browser. The web interface is used for system management, call management such as call transfer, diagnostics and software uploads.

Value space: On/Off
- **On**: The HTTP protocol is enabled.
- **Off**: The HTTP protocol is disabled.

Example: NetworkServices HTTP Mode: On

**NetworkServices HTTPS Mode**
HTTPS is a web protocol that encrypts and decrypts user page requests as well as the pages that are returned by the web server.

Value space: On/Off
- **On**: The HTTPS protocol is enabled.
- **Off**: The HTTPS protocol is disabled.

Example: NetworkServices HTTPS Mode: On

**NetworkServices HTTPS VerifyServerCertificate**
When the system connects to an external HTTPS server (like a phonebook server or an external manager), this server will present a certificate to the system to identify itself. This setting tells the system if it should verify that the certificate is signed by a trusted Certificate Authority (CA). This requires that list of trusted CAs is uploaded to the system in advance.

Value space: On/Off
- **On**: Verify server certificates.
- **Off**: Do not verify server certificates.

Example: NetworkServices HTTPS VerifyServerCertificate: Off
NetworkServices NTP Mode

The Network Time Protocol (NTP) is used to synchronize the time of the system to a reference time server. The time server will subsequently be queried every 24th hour for time updates. The time will be displayed on the top of the screen. The system will use the time to timestamp messages transmitted to Gatekeepers or Border Controllers requiring H.235 authentication. The system will use the time to timestamp messages transmitted to Gatekeepers or Border Controllers that requires H.235 authentication. It is also used for timestamping Placed Calls, Missed Calls and Received Calls.

Value space:  <Auto/Manual>
- Auto: The system will use the NTP server, by which address is supplied from the DHCP server in the network. If no DHCP server is used, or the DHCP server does not provide the system with a NTP server address, the system will use the static defined NTP server address specified by the user.
- Manual: The system will always use the static defined NTP server address specified by the user.

Example: NetworkServices NTP Mode: Manual

NetworkServices NTP Address

Enter the NTP Address to define the network time protocol server address. This address will be used if NTP Mode is set to Manual, or if set to Auto and no address is supplied by a DHCP server.

Value space:  <S: 0, 64>

Format: String with a maximum of 64 characters.

Example: NetworkServices NTP Address: "1.123.45.67.pool.ntp.org"

NetworkServices SIP Mode

Determines whether the system should be able to place and receive SIP calls. NOTE! Requires a restart of the codec.

Value space:  <On/Off>
- On: Enable the possibility to place and receive SIP calls (default).
- Off: Disable the possibility to place and receive SIP calls.

Example: NetworkServices SIP Mode: On

NetworkServices SNMP Mode

SNMP (Simple Network Management Protocol) is used in network management systems to monitor network-attached devices (routers, servers, switches, projectors, etc) for conditions that warrant administrative attention. SNMP exposes management data in the form of variables on the managed systems, which describe the system configuration. These variables can then be queried (set to ReadOnly) and sometimes set (set to ReadWrite) by managing applications.

Value space:  <Off/ReadOnly/ReadWrite>
- Off: Disable the SNMP network service.
- ReadOnly: Enable the SNMP network service for queries only.
- ReadWrite: Enable the SNMP network service for both queries and commands.

Example: NetworkServices SNMP Mode: ReadWrite

NetworkServices SNMP Host [1..3] Address

Enter the address of up to three SNMP Managers. All traps will then be sent to the hosts listed. The system’s SNMP Agent (in the codec) responds to requests from SNMP Managers (a PC program etc.). SNMP Traps are generated by the SNMP Agent to inform the SNMP Manager about important events. Can be used to send event created messages to the SNMP agent about different events like: system reboot, system dialing, system disconnecting, MCU call, packet loss etc. Traps can be sent to multiple SNMP Trap Hosts.

Value space:  <S: 0, 64>

Format: String with a maximum of 64 characters.

Example: NetworkServices SNMP Host 1 Address: ""

NetworkServices SNMP CommunityName

Enter the name of the Network Services SNMP Community. The SNMP Community names are used to authenticate SNMP requests. The SNMP requests must have a ‘password’ (case sensitive) in order to receive a response from the SNMP Agent in the codec. The default password is “public”. If you have the TANDBERG Management Suite (TMS) you must make sure the same SNMP Community is configured there too. NOTE! The SNMP Community password is case sensitive.

Value space:  <S: 0, 50>

Format: String with a maximum of 50 characters.

Example: NetworkServices SNMP CommunityName: "public"

NetworkServices SNMP SystemContact

Enter the name of the Network Services SNMP System Contact.

Value space:  <S: 0, 50>

Format: String with a maximum of 50 characters.

Example: NetworkServices SNMP SystemContact: ""
The NetworkServices settings, cont...

**NetworkServices SNMP SystemLocation**

Enter the name of the Network Services SNMP System Location.

Value space: \(<S: 0, 50>\)

**Format:** String with a maximum of 50 characters.

**Example:** `NetworkServices SNMP SystemLocation: ""`

**NetworkServices Telnet Mode**

Telnet is a network protocol used on the Internet or Local Area Network (LAN) connections.

Value space: \(<\text{On/Off}>\)

**On:** The Telnet protocol is enabled.

**Off:** The Telnet protocol is disabled. This is the factory setting.

**Example:** `NetworkServices Telnet Mode: Off`

The Phonebook settings

**Phonebook Server [1..5] ID**

Enter a name for the external phonebook.

Value space: \(<S: 0, 64>\)

**Format:** String with a maximum of 64 characters.

**Example:** `Phonebook Server 1 ID: ""`

**Phonebook Server [1..5] Type**

Select the phonebook server type.

Value space: \(<\text{VCS/TMS/Callway}>\)

**VCS:** Select VCS if the phonebook is located on the TANDBERG Video Communication Server.

**TMS:** Select TMS if the phonebook is located on the TANDBERG Management Suite server.

**Callway:** Select Callway if the phonebook is to be provided by the Callway subscription service.

Contact your Callway provider for more information.

**Example:** `Phonebook Server 1 Type: TMS`

**Phonebook Server [1..5] URL**

Enter the address (URL) to the external phonebook server.

Value space: \(<S: 0, 255>\)

**Format:** String with a maximum of 255 characters.

**Example:** `Phonebook Server 1 URL: "http://tms.company.com/tms/public/external/phonebook/phonebook.asmx"`
The Provisioning settings

Provisioning Mode
Provides the possibility of managing the codec (endpoint) by using an external manager/management system.

Value space:  <Off/TMS/Callway>

- **Off**: The system will not try to register to any management system.
- **TMS**: If set to TMS (TANDBERG Management System) the system will try to register with a TMS server. Contact your TANDBERG representative for more information.
- **Callway**: If set to Callway the system will try to register with the Callway subscription provider. Contact your Callway provider for more information.

Example: Provisioning Mode: TMS

Provisioning ExternalManager Address
Enter the IP Address to the External Manager/Management system. If an External Manager address and a path is configured, the system will post an HTTP message to this address when starting up. When receiving this HTTP posting the External Manager (typically a management system) can return configurations/commands to the unit as a result. If the DHCP Option 242 is returned in the DHCP response from the DHCP server the system will interpret this as the External Manager address to use.

Value space:  <S: 0, 64>

- **Format**: Only the valid IP address format is accepted. An IP address that contains letters (192.a.2.0) or unvalid IP addresses (192.0.1234.0) will be rejected.

Example: Provisioning ExternalManager Address: ""

Provisioning ExternalManager Path
Set the path to the External Manager/Management system. If an External Manager address and a path is configured, the system will post an HTTP message to this address when starting up. When receiving this HTTP posting the External Manager (typically a management system) can return configurations/commands to the unit as a result. If the DHCP Option 242 is returned in the DHCP response from the DHCP server the system will interpret this as the External Manager address to use.

Value space:  <S: 0, 255>

- **Format**: String with a maximum of 255 characters.

Example: Provisioning ExternalManager Path: "tms/public/external/management/SystemManagementService.asmx"

Provisioning ExternalManager Protocol
Determines whether or not to use secure management.

Value space:  <HTTP/HTTPS>

- **HTTP**: Set to HTTP to disable secure management. Requires HTTP to be enabled in the NetworkServices HTTP Mode setting.
- **HTTPS**: Set to HTTPS to enable secure management. Requires HTTPS to be enabled in the NetworkServices HTTPS Mode setting.

Example: Provisioning ExternalManager Protocol: HTTP

Provisioning HttpMethod
Select the HTTP method to be used for the provisioning.

Value space:  <GET/POST>

- **GET**: Select GET when the provisioning server supports GET.
- **POST**: Select POST when the provisioning server supports POST.

Example: Provisioning HttpMethod: POST

Provisioning LoginName
Enter the user id provided by the provisioning server. This is the user name part of the credentials used to authenticate towards the HTTP server when using HTTP provisioning.

Value space:  <S: 0, 80>

- **Format**: String with a maximum of 80 characters.

Example: Provisioning LoginName: ""

Provisioning Password
Enter the password provided by the provisioning server. This is the password part of the credentials used to authenticate towards the HTTP server when using HTTP provisioning.

Value space:  <S: 0, 64>

- **Format**: String with a maximum of 64 characters.

Example: Provisioning Password: ""
The SerialPort settings

**SerialPort BaudRate**
Specify the baud rate (data transmission rate, bits per second) for the COM 1 port on the codec. The default value is 38400.
Connection parameters for the COM port: Data bits: 8 Parity: None Stop bits: 1 Flow control: None.
Value space: <9600/19200/38400/57600/115200>
Range: Select a baud rate from the baud rates listed (bps).
**Example:** SerialPort BaudRate: 38400

**SerialPort LoginRequired**
The Serial Login setting determines whether or not there should be a login when connecting to the COM 1 port on the codec.
Value space: <On/Off>
On: Login is required when connecting to the codec through COM port.
Off: The user can access the codec through COM port without any login.
**Example:** SerialPort LoginRequired: On

The SIP settings

**SIP Profile [1..1] Authentication [1..1] LoginName**
This is the user name part of the credentials used to authenticate towards the SIP proxy.
Value space: <S: 0, 50>
Format: String with a maximum of 50 characters.
**Example:** SIP Profile 1 Authentication 1 LoginName: ""

**SIP Profile [1..1] Authentication [1..1] Password**
This is the password part of the credentials used to authenticate towards the SIP proxy.
Value space: <S: 0, 50>
Format: String with a maximum of 50 characters.
**Example:** SIP Profile 1 Authentication 1 Password:

**SIP Profile [1..1] DefaultTransport**
Select the transport protocol to be used over the LAN.
Value space: <UDP/TCP/TLS/Auto>
UDP: The system will always use UDP as the default transport method.
TCP: The system will always use TCP as the default transport method.
TLS: The system will always use TLS as the default transport method. For TLS connections a SIP CA-list can be uploaded using the web interface. If no such CA-list is available on the system then anonymous Diffie Hellman will be used.
Auto: The system will try to connect using transport protocols in the following order: TLS, TCP, UDP.
**Example:** SIP Profile 1 DefaultTransport: Auto

**SIP Profile [1..1] Outbound**
Value space: <On/Off>
On: Set up multiple outbound connections to servers in the Proxy Address list.
Off: Connect to the single proxy configured first in Proxy Address list.
**Example:** SIP Profile 1 Outbound: Off
The SIP settings, cont...

**SIP Profile [1..1] Proxy [1..4] Address**
The Proxy Address is the manually configured address for the outbound proxy. It is possible to use a fully qualified domain name, or an IP address. The default port is 5060 for TCP and UDP but another one can be provided. If Outbound is enabled, multiple proxies can be addressed.

Value space: \(<S: 0, 255>\)

Format: Compact string with a maximum of 255 characters. An IP address that contains letters (192.a.2.0) or unvalid IP addresses (192.0.1234.0) will be rejected.

Example: SIP Profile 1 Proxy 1 Address: “”

**SIP Profile [1..1] Proxy [1..4] Discovery**
Select if the SIP Proxy address is to be obtained manually or by using Dynamic Host Configuration Protocol (DHCP).

Value space: \(<Auto/Manual>\)

Manual: When Manual is selected, the manually configured SIP Proxy address will be used.
Auto: When Auto is selected, the SIP Proxy address is obtained using Dynamic Host Configuration Protocol (DHCP).

Example: SIP Profile 1 Proxy 1 Discovery: Manual

**SIP Profile [1..1] Type**
Enables SIP extensions and special behaviour for a vendor or provider.

Value space: \(<Standard/Alcatel/Avaya/Cisco/Microsoft/Nortel/Experimental/Siemens>\)

Standard: Should be used when registering to standard SIP proxy like OpenSIP.
Alcatel: Must be used when registering to a Alcatel-Lucent OmniPCX Enterprise R7 or later.
Avaya: Must be used when registering to a Avaya Communication Manager.
Cisco: Must be used when registering to a Cisco CallManager version 5 or later.
Microsoft: Must be used when registering to a Microsoft LCS or OCS server.
Nortel: Must be used when registering to a Nortel MCS 5100 or MCS 5200 PBX.
Experimental: Can be used if auto is not working. NOTE! This mode is for testing purposes only.

Example: SIP Profile 1 Type: Standard

**SIP Profile [1..1] URI**
The SIP URI or number is used to address the system. This is the URI that is registered and used by the SIP services to route inbound calls to the system. A Uniform Resource Identifier (URI) is a compact string of characters used to identify or name a resource.

Value space: \(<S: 0, 255>\)

Format: Compact string with a maximum of 255 characters.

Example: SIP Profile 1 URI: “sip:firstname.lastname@company.com”

The Standby settings

**Standby Control**
Determine whether the system should go into standby mode or not.

Value space: \(<On/Off>\)

On: Enter standby mode when the Standby Delay has timed out. NOTE! Requires the Standby Delay to be set to an appropriate value.
Off: The system will not enter standby mode.

Example: Standby Control: On

**Standby Delay**
Define how long (in minutes) the system shall be in idle mode before it goes into standby mode. NOTE! Requires the Standby Control to be enabled.

Value space: \(<1..480>\)

Range: Select a value from 1 to 480 minutes.

Example: Standby Delay: 10

**Standby BootAction**
Define the camera position after a restart of the codec.

Value space: \(<None/Preset1/Preset2/Preset3/Preset4/Preset5/Preset6/Preset7/Preset8/Preset9/Preset10/Preset11/Preset12/Preset13/Preset14/Preset15/RestoreCameraPosition/DefaultCameraPosition>\)

None: No action.
Preset1 to Preset15: After a reboot the camera position will be set to the position defined by the selected preset.
RestoreCameraPosition: After a reboot the camera position will be set to the position it had before the last boot.
DefaultCameraPosition: After a reboot the camera position will be set to the factory default position.

Example: Standby BootAction: DefaultCameraPosition

**Standby StandbyAction**
Define the camera position when going into standby mode.

Value space: \(<None/PrivacyPosition>\)

None: No action.
PrivacyPosition: Turns the camera to a sideways position for privacy.

Example: Standby StandbyAction: PrivacyPosition
The Standby settings, cont...

**Standby WakeupAction**

Define the camera position when leaving standby mode.

Value space: `<None/Preset1/Preset2/Preset3/Preset4/Preset5/Preset6/Preset7/Preset8/Preset9/Preset10/Preset11/Preset12/Preset13/Preset14/Preset15/RestoreCameraPosition/DefaultCameraPosition>`

- **None**: No action.
- **Preset1 to Preset15**: When leaving standby the camera position will be set to the position defined by the selected preset.
- **RestoreCameraPosition**: When leaving standby the camera position will be set to the position it had before entering standby.
- **DefaultCameraPosition**: When leaving standby the camera position will be set to the factory default position.

Example: Standby WakeupAction: RestoreCameraPosition

The SystemUnit settings

**SystemUnit CallLogging Mode**

Set the call logging mode for calls that are received or placed by the system. The call logs may then be viewed via the GUI or using the `xHistory` command.

Value space: `<On/Off>`

- **On**: Enable logging.
- **Off**: Disable logging.

Example: SystemUnit CallLogging Mode: On

**SystemUnit IrSensor Mode**

The IR sensor LED is located in the front of the codec and flickers when an IR signal is received from the remote control.

Value space: `<On/Off/Auto>`

- **On**: Enable the IR sensor on the codec.
- **Off**: Disable the IR sensor on the codec.
- **Auto**: Both the TANDBERG codec and camera has an IR sensor. The system will automatically disable the IR sensor on the codec if the IR sensor at camera is enabled. Otherwise the IR sensor on the codec will be enabled.

Example: SystemUnit IrSensor Mode: On

**SystemUnit MenuLanguage**

The setting is used to select the language for the GUI (Graphical User Interface).

Value space: `<English/Norwegian/Swedish/German/French/Italian/Japanese/Russian/Spanish/Korean/Finnish/ChineseSimplified/ChineseTraditional/PortugueseBrazilian/Turkish/Polish/Danish/Dutch>`

Example: SystemUnit MenuLanguage: English

**SystemUnit Name**

Enter a System Name to define a name of the system unit. If the H.323 Alias ID is configured on the system then this ID will be used instead of the system name. The system name will be displayed:

1) When the codec is acting as an SNMP Agent.
2) Towards a DHCP server.

Value space: `<S: 0, 50>`

**Format**: String with a maximum of 50 characters.

Example: SystemUnit Name: “Meeting Room Name”
The Time settings

**Time Date Format**

Set the date format.

- **Value space:** `<DD_MM_YY/MM_DD_YY/YY_MM_DD>`
  - **DD_MM_YY:** The date January 30th 2010 will be displayed: 30.01.10
  - **MM_DD_YY:** The date January 30th 2010 will be displayed: 01.30.10
  - **YY_MM_DD:** The date January 30th 2010 will be displayed: 10.01.30

**Example:** Time Date Format: DD_MM_YY

**Time Time Format**

Set the time format.

- **Value space:** `<24H/12H>`
  - **24H:** Set the time format to 24 hours.
  - **12H:** Set the time format to 12 hours (AM/PM).

**Example:** Time Time Format: 24H

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**Time Zone**

Set the time zone where the system is located, using Windows time zone description format.

- **Value space:** `<GMT-12:00 (International Date Line West)/GMT-11:00 (Midway Island, Samoa)/GMT-10:00 (Hawaii)/GMT-09:00 (Alaska)/GMT-08:00 (Pacific Time (US & Canada) Tijuana)/GMT-07:00 (Arizona)/GMT-07:00 (Mountain Time (US & Canada))/GMT-07:00 (Chihuahua, La Paz, Mazatlan)/GMT-06:00 (Central America)/GMT-06:00 (Saskatchewan)/GMT-06:00 (Guadalajara, Mexico City, Monterrey)/GMT-06:00 (Central Time (US & Canada))/GMT-05:00 (Indiana (East))/GMT-05:00 (Bogota, Lima, Quito)/GMT-05:00 (Eastern Time (US & Canada))/GMT-04:30 (Caracas)/GMT-04:00 (La Paz)/GMT-04:00 (Santiago)/GMT-04:00 (Atlantic Time (Canada))/GMT-03:30 (Newfoundland)/GMT-03:00 (Buenos Aires, Georgetown)/GMT-03:00 (Greenland)/GMT-03:00 (Brasilia)/GMT-02:00 (Mid-Atlantic)/GMT-01:00 (Cape Verde Is.)/GMT-01:00 (Azores)/GMT (Casablanca, Monrovia)/GMT (Coordinated Universal Time)/GMT (Greenwich Mean Time : Dublin, Edinburgh, Lisbon, London)/GMT+01:00 (West Central Africa)/GMT+01:00 (Amsterdam, Berlin, Bern, Rome, Stockholm, Vienna)/GMT+01:00 (Brussels, Copenhagen, Madrid, Paris)/GMT+01:00 (Sarajevo, Skopje, Warsaw, Zagreb)/GMT+01:00 (Belgrade, Bratislava, Budapest, Ljubljana, Prague)/GMT+02:00 (Harare, Pretoria)/GMT+02:00 (Jerusalem)/GMT+02:00 (Athens, Istanbul, Minsk)/GMT+02:00 (Helsinki, Kyiv, Riga, Sofia, Tallinn, Vilnius)/GMT+02:00 (Nairobi)/GMT+02:00 (Kuwait, Riyadh)/GMT+03:00 (Moscow, St. Petersburg, Volgograd)/GMT+03:00 (Baghdad)/GMT+03:30 (Tehran)/GMT+04:00 (Abu Dhabi, Muscat)/GMT+04:00 (Baku, Tbilisi, Yerevan)/GMT+04:30 (Kabul)/GMT+05:00 (Islamabad, Karachi, Tashkent)/GMT+05:00 (Ekaterinburg)/GMT+05:30 (Chennai, Kolkata, Mumbai, New Delhi)/GMT+05:45 (Kathmandu)/GMT+06:00 (Sri Jayawardenepura)/GMT+06:00 (Astana, Dhaka)/GMT+06:00 (Almaty, Novosibirsk)/GMT+06:30 (Rangoon)/GMT+07:00 (Bangkok, Hanoi, Jakarta)/GMT+07:00 (Krasnoyarsk)/GMT+08:00 (Perth)/GMT+08:00 (Taipei)/GMT+08:00 (Kuala Lumpur, Singapore)/GMT+08:00 (Beijing, Chongqing, Hong Kong, Urumqi)/GMT+08:00 (Irkutsk, Ulaan Batar)/GMT+09:00 (Osaka, Sapporo, Tokyo)/GMT+09:00 (Seoul)/GMT+09:00 (Yakutsk)/GMT+09:30 (Darwin)/GMT+09:30 (Adelaide)/GMT+10:00 (Guam, Port Moresby)/GMT+10:00 (Brisbane)/GMT+10:00 (Vladivostok)/GMT+10:00 (Hobart)/GMT+10:00 (Canberra, Melbourne, Sydney)/GMT+11:00 (Magadan, Solomon Is., New Caledonia)/GMT+12:00 (Fiji, Kamchatka, Marshall Is.)/GMT+12:00 (Auckland, Wellington, GM+)`

**Example:** Time Zone: “GMT (Greenwich Mean Time : Dublin, Edinburgh, Lisbon, London)”
The Video settings

**Video DefaultPresentationSource**

Define which video input source shall be used as the default presentation source (e.g. when you press the Presentation key on the remote control). The input source is configured to a video input connector. See the Video Input Matrix table at the back of the codec and the description of the Video Input Matrix in the Interfaces section.

Value space: <1..5>

*Range:* Select the video source to be used as the presentation source.

**Example:** Video DefaultPresentationSource: 3

**Video Input DVI [3, 5] Type**

The official DVI standard supports both digital and analog signals. In most cases the default AutoDetect setting can detect whether the signal is analog RGB or digital. However, in some rare cases when DVI-I cables are used (these cables can carry both the analog and digital signals) the auto detection fails. This setting makes it possible to override the AutoDetect and select the correct DVI video input. This setting should also be used if the video input is an analog component (YPbPr) type signal. This is used by some cameras (Sony EVI-HD1) and DVD/Blu-ray players. Since it is not possible to auto detect the difference between AnalogRGB and AnalogYPbPr, the AnalogYPbPr setting must be selected.

Value space: <AutoDetect/Digital/AnalogRGB/AnalogYPbPr>

*AutoDetect:* Set to AutoDetect to automatically detect if the signal is analog RGB or digital.

*Digital:* Set to Digital to force the DVI video input to Digital when using DVI-I cables with both analog and digital pins and AutoDetect fails.

*AnalogRGB:* Set to AnalogRGB to force the DVI video input to AnalogRGB when using DVI-I cables with both analog and digital pins and AutoDetect fails.

*AnalogYPbPr:* Set to AnalogYPbPr to force the DVI video input to analogYPbPr, as the component (YPbPr) signal cannot be auto detected.

**Example:** Video Input DVI 3 Type: AutoDetect

**Video Input Source [1] Connector**

Select which video input connector to be active on video input source 1.

Value space: <HDMI/HDSI/YPbPr>

*HDMI:* Select HDMI when you want to use the HDMI 1 as input source 1.

*HDSI:* Select HD-SDI when you want to use the HD-SDI 1 as input source 1.

*YPbPr:* Select YPbPr when you want to use the YPbPr 1 (Component) connectors as input source 1. Connect to the first row of Y, Pb and Pr connectors.

**Example:** Video Input Source 1 Connector: HDMI

**Video Input Source [2] Connector**

Select which video input connector to be active on video input source 2.

Value space: <HDMI/HDSI/YPbPr>

*HDMI:* Select HDMI when you want to use the HDMI 2 as input source 2.

*HDSI:* Select HD-SDI when you want to use the HD-SDI 2 as input source 2.

*YPbPr:* Select YPbPr when you want to use the YPbPr 2 (Component) as input source 2. Connect to the second row of Y, Pb and Pr connectors.

**Example:** Video Input Source 2 Connector: HDMI

**Video Input Source [3] Connector**

Select which video input connector to be active on video input source 3.

Value space: <HDMI/HDSI/DVI>

*DVI:* Select DVI-I when you want to use the DVI-I 3 as input source 3.

*HDMI:* Select HDMI when you want to use the HDMI 3 as input source 3.

*HDSI:* Select HD-SDI when you want to use the HD-SDI 3 as input source 3.

**Example:** Video Input Source 3 Connector: DVI

**Video Input Source [4] Connector**

Select which video input connector to be active on video input source 4.

Value space: <HDMI/HDSI>

*HDMI:* Select HDMI when you want to use the HDMI 4 as input source 4.

*HDSI:* Select HD-SDI when you want to use the HD-SDI 4 as input source 4.

**Example:** Video Input Source 4 Connector: HDMI

**Video Input Source [5] Connector**

Select which video input connector to be active on video input source 5.

Value space: <DVI/Composite/YC>

*DVI:* Select DVI-I when you want to use the DVI-I 5 as input source 5.

*Composite:* Select Composite when you want to use Composite as input source 5.

*YC:* Select YC when you want to use the S-Video (YC) as input source 5. Connect to the two connectors marked Y/Comp and C.

**Example:** Video Input Source 5 Connector: DVI
The **Video settings**, cont...

**Video Input Source [1..5] Name**
Enter a name for the video input source 1 to 5.

Value space: $<S: 0, 50>$

*Format:* String with a maximum of 50 characters.

*Example:* Video Input Source 1 Name: ""

**Video Input Source [1..5] CameraControl Mode**
Set the camera control mode for the camera associated with the video source 1 to 5.

Value space: $<\text{On/Off}>$

*On:* Enable camera control.
*Off:* Disable camera control.

*Example:* Video Input Source 1 CameraControl Mode: On

**Video Input Source [1..5] CameraControl CameraId**
The CameraId represents the camera’s position in the Visca chain. **NOTE!** Requires the Video Input Source CameraControl Mode to be enabled.

Read more about cascaded cameras and Visca commands in the TANDBERG PrecisionHD 1080p User Guide. Go to: http://www.tandberg.com/docs.

Value space: $<1..5>$

*Select the ID of the camera in the Visca chain.*

*Example:* Video Input Source 1 CameraControl CameraId: 1

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**Video Input Source [1..5] OptimalDefinition Profile**
Adjust how rapidly the system will increase the transmitted resolution when increasing the bandwidth. **NOTE!** Requires that the Video Input Source Quality is set to Motion.

Normal: Use this setting for normal to poorly lit environment. If the source is a camera with 1920x1080p60, the system will transmit 1920x720p60 at about 2.2Mb/sec and above with this setting set to normal.

Medium: Requires better than normal and consistent lighting and good quality video inputs. If the source is a camera with 1920x1080p60, the system will transmit 1920x720p60 at about 1.4Mb/sec and above with this setting set to medium.

High: Requires good lighting conditions for a good overall experience and good quality video inputs. If the source is a camera with 1920x1080p60, the system will transmit 1920x720p60 at about 1.1Mb/sec and above with this setting set to high.

Value space: $<\text{Normal/Medium/High}>$

See Table 1: Optimal definition for systems supporting 1080p and Table 2: Optimal definition for systems supporting 720p60.

*Example:* Video Input Source 1 OptimalDefinition Profile: Normal

| Table 1: Optimal definition, for systems supporting 1080p |
|---------------------------------|----------------|----------------|----------------|----------------|----------------|
| w288p30 | w448p30 | w576p30 | 720p30 | 1080p30 |
| Normal | 256kbit/s | 512 kbit/s | 768 kbit/s | 1152 kbit/s | 2560 kbit/s |
| Medium | 128kbit/s | 384 kbit/s | 768 kbit/s | 1152 kbit/s | 1920 kbit/s |
| High | 128kbit/s | 256 kbit/s | 768 kbit/s | 1152 kbit/s | 1472 kbit/s |

| Table 2: Optimal definition, for systems supporting 720p60 |
|---------------------------------|----------------|----------------|----------------|----------------|
| w144p60 | w288p60 | w448p60 | w576p60 | 720p60 |
| Normal | 128kbit/s | 512 kbit/s | 1152 kbit/s | 1472 kbit/s | 2240 kbit/s |
| Medium | 128kbit/s | 384 kbit/s | 768 kbit/s | 1152 kbit/s | 1920 kbit/s |
| High | 128kbit/s | 256 kbit/s | 768 kbit/s | 1152 kbit/s | 1152 kbit/s |
Video Input Source [1..5] OptimalDefinition Threshold60fps

For each video input, this setting tells the system the lowest resolution where it should transmit 60fps. So for all resolutions lower than this, the maximum transmitted framerate would be 30fps, while above this resolution 60fps would also be possible, if the available bandwidth is adequate.

Value space: <512x288/768x448/1024x576/1280x720/Never>

- 512x288: Set the threshold to 512x288.
- 768x448: Set the threshold to 768x448.
- 1024x576: Set the threshold to 1024x576.
- 1280x720: Set the threshold to 1280x720.
- Never: Do not set a threshold for transmitting 60fps.

Example: Video Input Source 1 OptimalDefinition Threshold60fps: 1280_720

Video Input Source [1..5] Quality

When encoding and transmitting video there will be a tradeoff between high resolution and high framerate. For some video sources it is more important to transmit high framerate than high resolution and vice versa. The Quality setting specifies whether to give priority to high frame rate or to high resolution for a given source.

Value space: <Motion/Sharpness>

- Motion: Gives the highest possible framerate. Used when there is a need for higher frame rates, typically when a large number of participants are present or when there is a lot of motion in the picture.
- Sharpness: Gives the highest possible resolution. Used when you want the highest quality of detailed images and graphics.

Example: Video Input Source 1 Quality: Motion

Video Layout ScaleToFrame

Define what to do if the aspect ratio of a video input source doesn’t match the aspect ratio of the corresponding image frame in a composition. For example if you have a 4:3 input source (like XGA) to be displayed on a 16:9 output (like HD720).

Value space: <Manual/MaintainAspectRatio/StretchToFit>

- Manual: If the difference in aspect ratio between the video input source and the target image frame is less than the ScaleToFrameThreshold configuration (in percent), the image is stretched to fit. If not, the system will maintain the original aspect ratio.
- MaintainAspectRatio: Will maintain the aspect ratio of the input source, and fill in black in the rest of the frame (letter boxing or pillar boxing).
- StretchToFit: Will stretch (horizontally or vertically) the input source to fit into the image frame.

Example: Video Layout ScaleToFrame: MaintainAspectRatio

Video Layout ScaleToFrameThreshold

Only applicable if the ScaleToFrame configuration is set to manual. If the difference in aspect ratio between the video input source and the target image frame is less than the ScaleToFrameThreshold configuration (in percent), the image is stretched to fit. If not, the system will maintain the original aspect ratio.

Value space: <0..100>

- Range: Select a value from 0 to 100 percent.

Example: Video Layout ScaleToFrameThreshold: 5

Video Layout Scaling

Define how the system shall adjust the aspect ratio for images or frames when there is a difference between the image and the frame it is to be placed in.

Value space: <On/Off>

- On: Let the system automatically adjust aspect ratio.
- Off: No adjustment of the aspect ratio.

Example: Video Layout Scaling: On

Video MainVideoSource

Define which video input source shall be used as the main video source.

Value space: <1..5>

- Range: Select the source to be used as the main video source.

Example: Video MainVideoSource: 1

Video Monitors

Set the monitor layout mode.

Value space: <Single/Dual/DualPresentationOnly/Quadruple>

- Single: The same layout is shown on all monitors.
- Dual: The layout is distributed on two monitors.
- DualPresentationOnly: All participants in the call will be shown on the first monitor, while the presentation (if any) will be shown on the second monitor.
- Quadruple: The layout is distributed on four monitors, so that each remote participant and the presentation will be shown on separate monitors.

Example: Video Monitors: Single
The Video settings, cont...

**Video OSD InputMethod InputLanguage**
The codec can be enabled for Cyrillic input characters in the GUI (Graphical User Interface). NOTE! Requires that Video OSD inputMethod Cyrillic is set to On.

Value space:  \(<\text{Latin}/\text{Cyrillic}>\)
  - \text{Latin}: Latin characters can be entered when using the remote control (default).
  - \text{Cyrillic characters can be entered using the remote control}. NOTE! Requires a TANDBERG Remote Control TRCS with Cyrillic fonts.

Example: Video OSD InputMethod InputLanguage: Latin

**Video OSD InputMethod Cyrillic**
This configuration is used to hide or show the Cyrillic mode as menu input language in the GUI (Graphical User Interface).

Value space:  \(<\text{On}/\text{Off}>\)
  - \text{On}: Cyrillic mode is available as a menu input language in the GUI. This will enable the setting Video OSD InputMethod InputLanguage.
  - \text{Off}: Cyrillic mode is NOT available as a menu input language in the GUI.

Example: Video OSD InputMethod Cyrillic: Off

**Video OSD Mode**
The Video OSD (On Screen Display) Mode lets you define if information and icons should be displayed on screen.

Value space:  \(<\text{On}/\text{Off}>\)
  - \text{On}: Display the on screen menus, icons and indicators.
  - \text{Off}: Hide the on screen menus, icons and indicators.

Example: Video OSD Mode: On

The Video settings, cont...

**Video OSD Output**
The Video OSD (On Screen Display) Output lets you define which monitor should display the on screen menus, information and icons. By default the OSD is sent to the monitor connected to the Video OSD Output 1. If you cannot see the OSD on screen, then you must re-configure the OSD Output. You can do this by entering a key sequence on the remote control, from the web interface, or by a command line interface.

Using the TANDBERG Remote Control TRCS: Press the Disconnect key followed by: "* # * # 0 x #" (where x is output 1 to 4).
Using the web interface: Open a web browser and enter the IP address of the codec. Open the Advanced menu and navigate to Video OSD Output and select the video output.
Using a command line interface: Open a command line interface and connect to the codec (if in doubt of how to do this, see the API Guide for the codec). Enter the command: `xConfiguration Video OSD Output [1..4]` (select the OSD Output).

Value space:  \(<1..4>\)
  - \text{Range}: Select 1 for HDMI 1 output, select 2 for DVI-I 2 output, select 3 for HDMI 3 output, or select 4 for DVI-I 4 output.

Example: Video OSD Output: 1

**Video OSD TodaysBookings**
This setting can be used to display the systems bookings for today on the main OSD menu. This requires that the system is bookable by an external booking system, like TMS (TANDBERG Management Suite).

Value space:  \(<\text{On}/\text{Off}>\)
  - \text{On}: Displays information about this systems bookings on screen.
  - \text{Off}: Do not display todays bookings.

Example: Video OSD TodaysBookings: Off

**Video OSD MyContactsExpanded**
Set how the local contacts will be displayed in the phone book dialog in the OSD (On Screen Display).

Value space:  \(<\text{On}/\text{Off}>\)
  - \text{On}: The local contacts in the phone book will be shown in the top level of the phonebook dialog.
  - \text{Off}: The local contacts will be placed in a separate folder called MyContacts in the phonebook dialog.

Example: Video OSD MyContactsExpanded: Off
The Video settings, cont...

**Video Output HDMI [1, 3] MonitorRole**

The HDMI monitor role describes what video stream will be shown on the monitor connected to the video output HDMI connector. Applicable only if the monitor configuration is set to dual or quadruple.

Value space: <First/Second/PresentationOnly/Third/Fourth>
- First: Show main video stream.
- Second: Show presentation video stream if active, or other participants.
- PresentationOnly: Show presentation video stream if active, and nothing else.
- Third: Use for remote participants (only for quadruple monitor setup).
- Fourth: Use for remote participants (only for quadruple monitor setup).

**Example:** Video Output HDMI 1 MonitorRole: First

**Video Output HDMI [1, 3] OverscanLevel**

Some TV's or other monitors may not display the whole image sent out on the system's video output, but cuts the outer parts of the image. In this case this setting can be used to let the system not use the outer parts of video resolution. Both the video and the OSD menu will be scaled in this case.

Value space: <Medium/High/None>
- Medium: The system will not use the outer 3% of the output resolution.
- High: The system will not use the outer 6% of the output resolution.
- None: The system will use all of the output resolution.

**Example:** Video Output HDMI 1 OverscanLevel: None

**Video Output HDMI [1, 3] Resolution**

Select the preferred resolution for the monitor connected to the video output HDMI connector. This will force the resolution on the monitor.

Value space: <Auto/640_480_60/800_600_60/1024_768_60/1280_1024_60/1280_720_60/1920_1080_60/1280_768_60/1360_768_60/1366_768_60/1600_1200_60/1920_1200_60>
- Auto: The system will automatically try to set the optimal resolution based on negotiation with the connected monitor.
- Range: 640x480@60p, 800x600@60p, 1024x768@60p, 1280x1024@60p, 1280x720@60p, 1920x1080@60p, 1280x768@60p, 1360x768@60p, 1366x768@60p, 1600x1200@60p, 1920x1200@60p

**Example:** Video Output HDMI 1 Resolution: 1920_1080_60

The Video settings, cont...

**Video Output DVI [2, 4] MonitorRole**

The DVI monitor role describes what video stream will be shown on the monitor connected to the video output DVI-I connector. Applicable only if the monitor configuration is set to dual or quadruple.

Value space: <First/Second/PresentationOnly/Third/Fourth>
- First: Show main video stream.
- Second: Show presentation video stream if active, or other participants.
- PresentationOnly: Show presentation video stream if active, and nothing else.
- Third: Use for remote participants (only for quadruple monitor setup).
- Fourth: Use for remote participants (only for quadruple monitor setup).

**Example:** Video Output DVI 4 MonitorRole: First

**Video Output DVI [2, 4] OverscanLevel**

Some TV's or other monitors may not display the whole image sent out on the system's video output, but cuts the outer parts of the image. In this case this setting can be used to let the system not use the outer parts of video resolution. Both the video and the OSD menu will be scaled in this case.

Value space: <Medium/High/None>
- Medium: The system will not use the outer 3% of the output resolution.
- High: The system will not use the outer 6% of the output resolution.
- None: The system will use all of the output resolution.

**Example:** Video Output DVI 2 OverscanLevel: None

**Video Output DVI [2, 4] Resolution**

Select the preferred resolution for the monitor connected to the video output DVI-I connector. This will force the resolution on the monitor.

Value space: <Auto/640_480_60/800_600_60/1024_768_60/1280_1024_60/1280_720_60/1920_1080_60/1280_768_60/1360_768_60/1366_768_60/1600_1200_60/1920_1200_60>
- Auto: The system will automatically try to set the optimal resolution based on negotiation with the connected monitor.
- Range: 640x480@60p, 800x600@60p, 1024x768@60p, 1280x1024@60p, 1280x720@60p, 1920x1080@60p, 1280x768@60p, 1360x768@60p, 1366x768@60p, 1600x1200@60p, 1920x1200@60p

**Example:** Video Output DVI 2 Resolution: 1920_1080_60
The Video settings, cont...

The Composite monitor role describes what video stream will be shown on the monitor connected to the video output Composite connector. Applicable only if the monitor configuration is set to dual or quadruple.

Value space: <First/Second/PresentationOnly/Third/Fourth>
- **First**: Show main video stream.
- **Second**: Show presentation video stream if active, or other participants.
- **PresentationOnly**: Show presentation video stream if active, and nothing else.
- **Third**: Use for remote participants (only for quadruple monitor setup).
- **Fourth**: Use for remote participants (only for quadruple monitor setup).

**Example:** Video Output Composite 5 MonitorRole: First

**Video Output Composite [5] OverscanLevel**
Some TV's or other monitors may not display the whole image sent out on the systems video output, but cuts the outer parts of the image. In this case this setting can be used to let the system not use the outer parts of video resolution. Both the video and the OSD menu will be scaled in this case.

Value space: <Medium/High/None>
- **Medium**: The system will not use the outer 3% of the output resolution.
- **High**: The system will not use the outer 6% of the output resolution.
- **None**: The system will use all of the output resolution.

**Example:** Video Output Composite 5 OverscanLevel: None

**Video Output Composite [5] Resolution**
Select the preferred resolution for the monitor connected to the video output Composite connector. This will force the resolution on the monitor.

Value space: <PAL/NTSC>
- **Range**: Select PAL or NTSC resolution.

**Example:** Video Output Composite 5 Resolution: NTSC

**Video Selfview**
The Video Selfview setting determines whether or not the main video source (self view) should be displayed on screen.

Value space: <On/Off>
- **On**: Show self view on screen.
- **Off**: Hide self view on screen.

**Example:** Video Selfview: On

**Video Wallpaper**
Select a background picture for the screen.

Value space: <None/Growing/Summersky/Custom>
- **None**: No wallpaper will be displayed on screen.
- **Summersky, Growing**: Select one of the predefined wallpapers to be displayed on screen.
- **Custom**: The custom wallpaper must be uploaded to the codec from the web interface.

1) **On the video system**: Find the IP address of the codec. Open the menu on screen and go to Home > Settings > System information to find the IP Address.
2) **On your computer**: Open a web browser and enter the IP address of the codec. Select “Wallpaper” from the menu, browse for the file, and press the “Upload” button.
3) **On the video system**: Open the menu on screen and go to Home > Settings > Wallpaper > Custom. Give it a few seconds to display the new picture. If the picture does not show, toggle once between “None” and “Custom” wallpaper to make the change take effect.

**Example:** Video Wallpaper: Summersky
The Experimental menu

The Advanced configurations menu has an option called Experimental. The settings within this menu can be used 'as is' and will not be fully documented. **NOTE!** The Experimental menu WILL change.

### Experimental Audio Input Microphone [1..8] Channel

- **Left**: The microphone signal is the left channel of a stereo signal.
- **Right**: The microphone signal is the right channel of a stereo signal.
- **Mono**: The microphone signal is a mono signal.

**Example:** Experimental Audio Input Microphone 1 Channel: Mono

### Experimental Audio Input Microphone [1..8] EchoControl HighPassFilter

Value space: <On/Off>

### Experimental AudioTracking Camera [1..7] Mode

Value space: <On/Off>

### Experimental CapsetFilter

Value space: <S: 0, 32>

### Experimental Conference [1..1] PacketLossResilience

Value space: <On/Off>

### Experimental CustomSoftbuttons State [1..2] Softbutton [1..5] Type

Value space: <NotSet/MainSource/PresentationSource/CameraPreset/Actions/SpeedDial>

### Experimental CustomSoftbuttons State [1..2] Softbutton [1..5] Value

Value space: <S: 0, 255>

### Experimental SoftwareUpgrade Mode

Value space: <Auto/Manual>

### Experimental SoftwareUpgrade ServerAddress

Value space: <S: 0, 255>

### Experimental SystemUnit Controller Address

Value space: <S: 0, 255>

The Experimental settings can be used 'as is'. **NOTE!** The Experimental settings WILL change.
Chapter 3

Password protection
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 Advanced menu

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

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.**

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.

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 change the menu password

1. 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.
Chapter 4

About monitors
About monitors when you have a Codec C90

The main monitor

The main monitor can be connected to any of the video outputs HDMI 1 (the default connector for the main monitor) HDMI 3 (the default connector for the dual monitor), DVI-I 2 or DVI-I 4.

Connecting to HDMI 1

The HDMI 1 output is, by default, defined as the main monitor connector. When you connect the main monitor to this output the menu and icons (OSD - on screen display) will show on this monitor.

Connecting to DVI-I 2, DVI-I 4, HDMI 3

When connecting the main monitor to the DVI–I 2, DVI–I 4 or HDMI 3 output, you must move the OSD to this output. If you cannot see any menu on screen you must run a key sequence on the remote control. The menu on screen, icons and other information (OSD - on screen display) will be moved to the selected output. At the same time, the resolution will be set to the default value, which is 1024x768@60Hz for DVI and 1280x720@60Hz for HDMI.

Moving the OSD using the remote control

If the main monitor is connected to DVI-I 2 video output you must run the following shortcut or key sequence on the remote control.

- Disconnect * # * # 0 #
  
  x=1 (HDMI 1); x=2 (DVI–I 2);
  x=3 (HDMI 3); x=4 (DVI–I 4)

Example: Set DVI-I 2 as the OSD output.

- * - # - # - # - 0 - 2 - #

Moving the OSD using API commands

You can also set the resolution and the OSD output by setting up a serial port connection and running API commands. See the API Guide for the codec for information about API commands.

Dual monitors

When you want to run a dual monitor setup, connect the second monitor to video output HDMI 3 on the codec.

Dual monitor configuration

Go to Advanced settings to set the monitor to dual:

1. Navigate to Settings > Advanced > Advanced settings > Video > Output > Monitor and set the Monitor to Dual.
Chapter 5

Audio matters
### Dynamic audio API

With a set of xCommand Audio API commands, the audio system is fully configurable:

- A local input is defined as a mix of input connectors. A local input can be created and deleted. You can add and remove input connectors and update the local input settings.
- A local output is a mix of local input and remote input signals. All connectors attached to a local output receive the same signal.
- A remote input and remote output pair is created for each call.
- A remote output receives the signals from all local and remote inputs, except the remote input from the same site.
- The mixer matrix of each local and remote output can easily be managed by disconnecting and connecting local and remote inputs.

### Example 1:

The dynamic audio API offers a great flexibility when configuring the system and it is simple to use. To have audio in your calls you only need one local input with a microphone attached to it, and one local output with an output connector attached to it.

When the call is established a remote input and remote output pair are created and all the connections to these from the local audio system are set up automatically.

<table>
<thead>
<tr>
<th>Local audio setup</th>
<th>Remote input/output pair</th>
<th>Diagram</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOCAL INPUT 1</td>
<td>REMOTE INPUT 3</td>
<td><img src="#" alt="Diagram" /></td>
</tr>
<tr>
<td>MICROPHONE 1</td>
<td></td>
<td><img src="#" alt="Diagram" /></td>
</tr>
<tr>
<td>MICROPHONE 2</td>
<td></td>
<td><img src="#" alt="Diagram" /></td>
</tr>
<tr>
<td>LOCAL OUTPUT 2</td>
<td>REMOTE OUTPUT 4</td>
<td><img src="#" alt="Diagram" /></td>
</tr>
<tr>
<td>Line 5</td>
<td></td>
<td><img src="#" alt="Diagram" /></td>
</tr>
<tr>
<td>Line 6</td>
<td></td>
<td><img src="#" alt="Diagram" /></td>
</tr>
</tbody>
</table>

The Local input 1 has been defined with two Microphones.

The Local output 2 has been defined with two Line outputs.

The audio from the Remote input 3 goes to the Local output 2.

The audio from the Local input 1 goes to the Remote output 4.
The equalizer

The system has 8 user defined equalizers, each made up of 6 second order IIR sections, see the illustration below. Each of these 8 equalizers can be applied to one or more of the audio input and output connectors on the codec.

The Audio Console application

We recommend using the Audio Console, with the build in equalizer GUI, to modify the equalizers. The Audio Console application is found at the TANDBERG Developer Zone web page.

Go to: http://developer.tandberg.com/web/guest/tools/integrators/audio-console

The equalizer filter parameters

Each section (1 ... 6) of each user defined equalizer (1 ... 8) can be modified independently by setting the four parameters:

- Filter type (Peaking, low shelf, high shelf, low pass, high pass)
- Frequency
- Gain
- Q-value

To switch off one of the six equalizer sections; set the second order section to have a flat frequency response. This can be done by setting the filter type to "none" or by setting the filter type to "peaking" and the gain to "0" (zero).

The filter types

The illustrations below shows the 5 different filter types and frequency response variations dependent on some of the parameter variations. The Q-value for low pass, high pass, low shelf and high shelf filters should be set to 1/sqrt(2) in order to get maximally flat responses. The Q-value (or Q-factor) is defined as Q=f0/bw. Where f0=resonance frequency in Hz; and bw=filter bandwith in Hz.
Microphone reinforcement

To improve speech intelligibility in a large room, the local microphones are played out on speakers locally as well as being sent to far end.

- The room can be viewed as being divided in two zones. It is assumed that there is a low acoustic coupling between microphones in zone 1 and speakers in zone 2 and vice versa.
- Microphones in zone 1 will be played out on all loudspeakers in zone 2.
- Microphones in both zones will be transmitted to far end.
- The input signal from far end will be played out on loudspeakers in both zones.
Stereo

Stereo in point to point call

Receive stereo

If the other participant sends stereo the codec will receive stereo. To play stereo the local output still needs to be configured correctly (see local stereo circuit example).

Transmit stereo

In order to send stereo, the other participant must be able to receive stereo. Also, the local input with the stereo signal must be configured correctly (see local stereo circuit example). In addition, there must be a signal on one of the connectors connected to the local input.

Stereo in Multisite

- The TANDBERG Codec C90 sends and receives stereo signals in multisite.
- The TANDBERG Codec C60/C40 will only send and receive mono signals in multisite.

Examples of local stereo configuration

When you want to record a stereo presentation the audio system can be configured as shown in the illustration.

In the example the local input has two connectors: Line 1 and Line 2. When these two connectors are mixed together as a stereo signal, Line 1 is the left channel and Line 2 is the right channel.

And the local output has two connectors: Line 3 and Line 4. The local output pans the stereo signal according to the channel configuration of the connectors. Line 3 receives the left channel and Line 4 receives the right channel.

Local stereo circuit example with API commands

The graphic gives a picture of how to configure the audio system for recording a stereo presentation. You can do the same from the API. The belonging xCommands and xConfigurations are listed below.

In this example there is a local input with input id 5 and a local output with output id 6. Both are set to stereo by the channels parameter.

- xCommand Audio LocalInput Update Inputid:5 Name:“Presentation” MixerMode:Fixed AGC:On Mute:Off Channels:2
- xCommand Audio LocalOutput Update Outputid:6 Name:“Recorder” Loudspeaker:No Channels:2
- xConfiguration Audio Input Line 1 Channel: Left
- xConfiguration Audio Input Line 2 Channel: Right
- xConfiguration Audio Output Line 3 Channel: Left
- xConfiguration Audio Output Line 4 Channel: Right
Chapter 6

Appendices
Optimal Definition Profiles

Under ideal lighting conditions the bandwidth requirements can be substantially reduced with the optimal definitions profiles. Generally, we recommend the Optimal Definition set at Normal. If lighting condition is conducive TANDBERG recommends that you test the endpoint on the various Optimal Definition setting prior to implementation.

To set the optimal definition profile

- Go to: Settings > Advanced > Advanced settings > Video > Input > Source [1..n] > OptimalDefinition > Profile
- Go to: Settings > Advanced > Advanced settings > Video > Input > Source [1..n] > OptimalDefinition > Threshold60fps

The Camera settings must be set to Motion to ensure the Optimal Definition to work. With the Camera settings set to Sharpness, the endpoint will transmit the highest resolution possible, regardless of frames per second.

To set the camera settings:

- Go to: Settings > Advanced > Advanced settings > Camera.

High (720p60)
Typically used in dedicated video conferencing rooms. Requires good lighting conditions for a good overall experience.
Under ideal conditions the bandwidth requirements can be reduced by up to 50%.

Medium (w576p60)
Typically used in rooms with better than normal, and consistent lighting.
The bandwidth requirements can be reduced by up to 25%.

Normal (w448p60)
This setting is typically used in office environments where the environment is normal to poorly lit.
Generally, we recommend the Optimal Definition set at Normal.

<table>
<thead>
<tr>
<th>Optimal definition profiles for systems supporting 1080p</th>
<th>30fps</th>
<th>w288p30</th>
<th>w448p30</th>
<th>w576p30</th>
<th>720p30</th>
<th>1080p30</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>256kbit/s</td>
<td>512 kbit/s</td>
<td>768 kbit/s</td>
<td>1152 kbit/s</td>
<td>2560 kbit/s</td>
<td></td>
</tr>
<tr>
<td>Medium</td>
<td>128kbit/s</td>
<td>384 kbit/s</td>
<td>512 kbit/s</td>
<td>1152 kbit/s</td>
<td>1920 kbit/s</td>
<td></td>
</tr>
<tr>
<td>High</td>
<td>128kbit/s</td>
<td>256 kbit/s</td>
<td>512 kbit/s</td>
<td>768 kbit/s</td>
<td>1472 kbit/s</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Optimal definition profiles for systems supporting 720p60</th>
<th>60fps</th>
<th>w144p60</th>
<th>w288p60</th>
<th>w448p60</th>
<th>w576p60</th>
<th>720p60</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>128kbit/s</td>
<td>512 kbit/s</td>
<td>1152 kbit/s</td>
<td>1472 kbit/s</td>
<td>2240 kbit/s</td>
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</tr>
<tr>
<td>Medium</td>
<td>128kbit/s</td>
<td>384 kbit/s</td>
<td>768 kbit/s</td>
<td>1152 kbit/s</td>
<td>1920 kbit/s</td>
<td></td>
</tr>
<tr>
<td>High</td>
<td>128kbit/s</td>
<td>256 kbit/s</td>
<td>512 kbit/s</td>
<td>768 kbit/s</td>
<td>1152 kbit/s</td>
<td></td>
</tr>
</tbody>
</table>
The Video Input Matrix

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

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.

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

Go to the Advanced configuration menu on screen to configure the video inputs.

Navigate to: Settings > Advanced > Advanced Configurations > Video > Input > Source 1. Configure the five video input sources:

- Video Input Source [1–5] Connector: <HDMI/HDSDI/DVI/YC/Composite/YPbPr> (the value space will differ by connector)
- Video Input Source [1–5] Name: <Enter a name, and save>
- Video Input Source [1–5] Quality: <Motion/Sharpness>

Navigate to: Settings > Advanced > Advanced Configurations > Video. Configure the main video source and the default presentation source for the system. The values <1–5> represents the video input sources [1–5].

- Video MainVideoSource: <1..5>
- Video DefaultPresentationSource: <1..5>

Default configurations

- 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 (which is the main camera)
- Video DefaultPresentationSource: 3 (which is the PC)
The TANDBERG DNAM (Digital Natural Audio Module) used in Profile 65”, is built on two specially designed and separate modules, which is the amplifier and the loudspeaker cabinet.

The DNAM Loudspeaker
- 3-way Center Speaker system
- Frequency range 50Hz - 20kHz
- 2 x 100mm low- and midrange loudspeakers, 8 ohms nominal, reference quality (SEAS Excel series)
- 1 x 25mm dome tweeter, 6 ohms nominal, excellent quality
- Crossover filtered audio signals received from DNAM amplifier
- Long time max power 70 Watt on all loudspeakers
- Enclosed MDF speaker cabinet

Integrated Stereo Speaker
2-way Stereo Speaker System, each side has:
- 1 x 100mm low- and midrange loudspeaker, 8 ohms nominal, reference quality (SEAS Excel series)
- 1 x 25mm dome tweeter, 6 ohms nominal, excellent quality
- Passive crossover filter
- Frequency range 70 Hz - 20 kHz
- Long time max power 70 Watt
- Enclosed MDF speaker cabinet

The DNAM Amplifier
- 3 x 50W continuous average Center Output Power (load specified by DNAM Center Speakers).
- 2 x 50W continuous average Stereo Output Power (load specified by TANDBERG Loudspeaker Stereo Kit).
- Full dynamic range for audio (high fidelity range) or integrated stereo speakers.
- Digital Signal Processing and Filtering on all channels for best audio detail clarity.
- Digital Crossover Filtering on center channels.
- In/out:
  Audio In - SPDIF (stereo) or Analog (mono), using the same connector.
  Differential In - {female XLR pinout: 1 - GND, 2 – Signal (+), 3 – Signal (-)}
  Loop Out - line out directly from the input, always analog even with SPDIF in.
  Stereo Out - (male XLR, common GND configuration)
- Fuse 2A 250V Slow, 5 x 20mm, Littelfuse type 215002.
## CE Declarations

### TANDBERG Codec C90

For an official, signed version of this document, or details regarding documentation from the technical construction file, please contact TANDBERG.

<table>
<thead>
<tr>
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### TANDBERG Profile using Codec C90

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China RoHS table

This product described in this guide complies with the Chinese RoHS.

<table>
<thead>
<tr>
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说明：

0：表示该有毒有害物质在所有配对材料中的含量均在中国标准《电子信息产品中有害物质的限量要求》(SJ/T 11363 2006) 所规定的限量要求以下。

X：表示该有毒有害物质至少在该部件的某一配对材料中的含量超出中国标准《电子信息产品中有害物质的限量要求》(SJ/T 11363-2006) 所规定的限量要求。

注意：在所售产品中未必包含所有上述所述部件。

除非在产品上有另外特别的标注，以下标志为针对所涉及产品的环保使用期限标志。环保使用期限只适用于产品在产品手册中所规定的使用条件。
Supported RFCs in SIP

The RFC (Request for Comments) series contains technical and organizational documents about the Internet, including the technical specifications and policy documents produced by the Internet Engineering Task Force (IETF).

Current RFCs and drafts supported in SIP
- RFC 1889 RTP: A Transport Protocol for Real-time Applications
- RFC 2190 RTP Payload Format for H.263 Video Streams
- RFC 2327 SDP: Session Description Protocol
- RFC 2396 Uniform Resource Identifiers (URI): Generic Syntax
- RFC 2617 Digest Authentication
- RFC 2782 DNS RR for specifying the location of services (DNS SRV)
- RFC 2833 RTP Payload for DTMF Digits, Telephony Tones and Telephony Signals
- RFC 2976 The SIP INFO Method
- RFC 3016 RTP Payload Format for MPEG-4 Audio/Visual Streams
- RFC 3047 RTP Payload Format for ITU-T Recommendation G.722.1
- RFC 3261 SIP: Session Initiation Protocol
- RFC 3262 Reliability of Provisional Responses in SIP
- RFC 3263 Locating SIP Servers
- RFC 3264 An Offer/Answer Model with SDP
- RFC 3311 UPDATE method
- RFC 3361 DHCP Option for SIP Servers
- RFC 3420 Internet Media Type message/sipfrag
- RFC 3515 Refer method
- RFC 3550 RTP: A Transport Protocol for Real-Time Applications
- RFC 3581 Symmetric Response Routing
- RFC 3605 RTCP attribute in SDP
- RFC 3711 The Secure Real-time Transport Protocol (SRTP)
- RFC 3840 Indicating User Agent Capabilities in SIP
- RFC 3890 A Transport Independent Bandwidth Modifier for SDP
- RFC 3891 The SIP “Replaces” Header
- RFC 3892 Referred-By Mechanism
- RFC 3960 Early Media
- RFC 3984 RTP Payload Format for H.264 Video
- RFC 4028 Session Timers in SIP
- RFC 4145 TCP-Based Media Transport in the SDP
- RFC 4568 SDP: Security Descriptions for Media Streams
- RFC 4574 The Session Description Protocol (SDP) Label Attribute
- RFC 4582 The Binary Floor Control Protocol
- RFC 4585 Extended RTP Profile for RTCP-Based Feedback
- RFC 4587 RTP Payload Format for H.261 Video Streams
- RFC 4629 RTP Payload Format for ITU-T Rec. H.263 Video
- RFC 5168 XML Schema for Media Control
- RFC 4796 The SDP Content Attribute
- RFC 4853 SDP Format for BFCP Streams
- RFC 5589: SIP Call Control Transfer
- draft-ietf-avt-rtp-h264-rcdo-02
- draft-ietf-avt-rtp-rfc3984bis-06
- draft-ietf-sip-outbound-20: Managing Client Initiated Connections

Media capabilities supported in SIP

The audio and video media capabilities supported in SIP are the same as for H.323.
**Technical specifications**

**TANDBERG Profile 65” Dual**

**UNIT DELIVERED COMPLETE WITH:**
- FullHD LCD Display, Codec C90, PrecisionHD 1080p camera, remote control, microphones, Digital Audio Module, integrated speakers and cabling

**MONITOR**
- Two 65” Full HD LCD, 16:9, 1080 X 1920 resolution

**BASE**
- Floor standing foot plate

**BANDWIDTH**
- H.323/SIP up to 6 Mbps point-to-point
- Up to 10 Mbps total MultiSite bandwidth

**FIREWALL TRAVERSAL**
- TANDBERG Expressway™ Technology
- H.460.18, H.460.19 Firewall Traversal

**VIDEO STANDARDS**
- H.261, H.263, H.263+, H.264
- H.460.18, H.460.19 Firewall Traversal

**VIDEO FEATURES**
- Native 16:9 Wide screen
- Advanced Screen Layouts
- Intelligent Video Management
- Local Auto Layout
- 9 embedded individual video compositors, one for every output and one for every encoder

**VIDEO INPUTS (13 INPUTS)**
- 4 x HDMI inputs, supported formats: 1920 x 1080@60 Hz (1080p60), 1280 x 720@60 Hz (720p60)
- 2 x DVI-I inputs, supported formats: 1920 x 1080@60 Hz (1080p60), 1280 x 720@60 Hz (720p60)
- 1 x S-Video/Composite input (BNC connector), supported formats: 1280 x 720@60 Hz (720p60)
- 1 X Composite output (BNC connector), supported formats: PAL/NTSC

**VIDEO OUTPUTS (5 OUTPUTS)**
- 2 x HDMI outputs, 2 x DVI-I outputs, supported formats: 1920 x 1080@60 Hz (1080p60), 1280 x 720@60 Hz (720p60)
- 2 x YPbPr inputs, supported formats: 1920 x 1080@60 Hz (1080p60), 1280 x 720@60 Hz (720p60)
- 1 x Analog RGB (DVI-A): same as HDMI, supported formats: 1920 x 1080@60 Hz (1080p60), 1280 x 720@60 Hz (720p60)

**AUDIO OUTPUTS (8 OUTPUTS)**
- 8 x microphone, 48V phantom powered, XLR connector each with separate echo cancellers and noise reduction, all microphones can be set for balanced line level
- 2 x RCA/Phono, Line Level: Stereo PC input
- 2 x RCA/Phono, Line Level: Stereo auxiliary/DVD input
- 2 x HDMI, digital: Stereo PC/DVD inputs

**AUDIO STANDARDS**
- G.711, G.722, G.722.1, 64 bit & 128 bit MPEG4 AAC-LD, AAC-LD Stereo

**AUDIO FEATURES**
- CD-Quality 20KHz Mono and Stereo
- Eight separate acoustic echo cancellers
- 8-port Audio mixer
- Automatic Gain Control (AGC)
- Automatic Noise Reduction
- Active lip synchronization

**AUDIO INPUTS (14 INPUTS)**
- 8 x microphone, 48V phantom powered, XLR connector each with separate echo cancellers and noise reduction, all microphones can be set for balanced line level
- 2 x RCA/Phono, Line Level: Stereo PC input
- 2 x RCA/Phono, Line Level: Stereo auxiliary/DVD input
- 2 x HDMI, digital: Stereo PC/DVD inputs

**DUAL STREAM**
- H.239 (H.323) dual stream
- BFCP (SIP) dual stream
- H.239 (H.323) dual stream

**LIVE VIDEO RESOLUTIONS (ENCODE/DECODE)**
- 176 x 144@30 fps (QCIF), 352 x 288@30 fps (CIF)
- 512 x 288@30 fps (w288p)
- 768 x 448@30 fps (448p)
- 1280 x 720@30 fps (w720p)
- 1024 x 768@30 fps (4CIF)
- 1280 x 720@30 fps (720p30)
- 1280 x 720@30 fps (720p60)
- 1280 x 720@30 fps (720p60)*
- 1920 x 1080@30 fps (1080p30)*
- 1920 x 1080@30 fps (1080p60)
- 1280 x 720@30 fps (720p30)
- 1280 x 720@30 fps (720p60)
- 1280 x 720@30 fps (720p60)*
- 1024 x 768@60 fps (w768p60)*
- 768 x 448@60 fps (448p60)*
- 1280 x 720@60 fps (720p60)*
- 1920 x 1080@20fps (WUXGA)

**APPLIANCES**
- TANDBERG Codec C90 and Profiles using C90 Administrator guide

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**D14635.03—MAY 2010 54  www.tandberg.com**
TANDBERG Profile 65” Dual, continued...

MULTISITE FEATURES
4-way High Definition SIP/H.323 MultiSite
Full individual audio and video transcoding up to 1080p30
Individual layouts in MultiSite CP (Takes out SelfView)
H.323/SIP/VoIP in the same conference
Best Impression (Automatic CP Layouts)
H.264, Encryption, Dual Stream from any site
IP Downspeeding
Dial in/Dial out
Conference rates up to 10 Mbps

OTHER INTERFACES
USB host for future usage
USB device for future usage

PRECISIONHD 1080P CAMERA
1/3” CMOS
12 x zoom
+15°/-25° tilt, +/- 90° pan
43.5° vertical field of view
72° horizontal field of view
Focus distance 0.3m–infinity
1920 x 1080 pixels progressive @ 60fps

OTHER FORMATS SUPPORTED (CONFIGURABLE THROUGH DIP-SWITCH):
1920 x 1080@60 Hz (HDMI only)
1920 x 1080@50 Hz (HDMI only)
1920 x 1080@30 Hz
1920 x 1080@25 Hz
1280 x 720@60 Hz
1280 x 720@50 Hz
1280 x 720@30 Hz
1280 x 720@25 Hz

Automatic or manual focus/brightness/whitebalance
Far-end camera control
Daisy-chain support (Visca protocol camera)
Dual HDMI and HD-SDI output
Upside-down mounting with automatic flipping of picture

SYSTEM MANAGEMENT
Support for the TANDBERG Management Suite
Total management via embedded SNMP, Telnet, SSH, XML, SOAP
Remote software upload: via web server, SCP, HTTP, HTTPS
1 x RS-232 local control and diagnostics
Remote control through on-screen menu system

DIRECTORY SERVICES
Support for Local directories (My Contacts)
Corporate Directory
Unlimited entries using Server directory supporting LDAP
and H.350
Unlimited number for Corporate directory (through TMS)
200 number local directory
Received Calls
Placed Calls

All specifications subject to change without notice, system specifics may vary.
All images in these materials are for representational purposes only, actual products may differ.
TANDBERG and Expressway are registered trademarks or trademarks of TANDBERG in the U.S. and other countries.
All other trademarks are property of their respective owners.

MTBF PRODUCT RELIABILITY/MTBF
The predicted reliability is expressed in the expected random Mean Time Between Failures (MTBF) for the electronic components for Codec C90 and PrecisionHD 1080p camera based on the Power On Hours:
Power On Hours (POH) > 69,000 hours
Useful Life Cycle > 6 years

ISO 9001 certificate is available upon request

March 2010

DIMENSIONS
Height: 65in/165cm
Width: 120in/300cm
Depth: 5.9in/15cm

WEIGHT
Weight: 660lbs/300kg

* requires option
** only one LAN/Ethernet interface supported
### Technical specifications

**TANDBERG Codec C90**

**UNIT DELIVERED COMPLETE WITH:**
- Video conferencing codecs, remote control, rack mounting rails, LAN cable, power cable

**BANDWIDTH**
- H.323/SIP up to 6 Mbps point-to-point
- Up to 10 Mbps total MultiSite bandwidth

**FIREWALL TRAVERSAL**
- TANDBERG Expressway™ Technology
- H.460.18, H.460.19 Firewall Traversal

**VIDEO STANDARDS**
- H.261, H.263+, H.264

**VIDEO FEATURES**
- Native 16:9 Widescreen
- Advenced Screen Layouts
- Intelligent Video Management
- Local Auto Layout

**VIDEO INPUTS (13 INPUTS)**

#### 4 x HDMI inputs, supported formats:
- 1920 x 1080@60 Hz (1080p60)
- 1920 x 1080@50 Hz (1080p50)
- 1920 x 1080@30 Hz (1080p30)
- 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, ref. above.
- Analog RGB (DVI-A):
  - 1920 x 1080@60 Hz (1080p60)
  - 1920 x 1280@60 Hz (SXGA)
  - 1280 x 768@60 Hz (WXGA)
  - 1280 x 720@60 Hz (720p60)

**AUDIO STANDARDS**
- AAC-LD Stereo
- G.711, G.722, G.722.1, 64 bit & 128 bit MPEG4 AAC-LD, AAC-LD Stereo

**AUDI0 FEATURES**
- CD-Quality 20kHz Mono and Stereo
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- Active lip synchronization

**AUDIO INPUTS (14 INPUTS)**
- 8 x microphone, 48V phantom powered, XLR connector each with separate echo cancellers and noise reduction, all microphones can be set for balanced line level
- 2 x RCA/Phono, Line Level: Stereo audio inputs
- 2 x RCA/Phono, Line Level: Stereo auxiliary/DVD input

**AUDIO OUTPUTS (8 OUTPUTS)**
- 2 x HDMI, digital: Stereo PC/DVD inputs
- 2 x HDMI, digital, stereo main audio
- 2 x HDMI, digital, stereo to recording device

**DUAL STREAM**
- H.239 (H.323) dual stream
- BFCP (SIP) dual stream
- Available in MultiSite from any site

**MULTISITE FEATURES**
- 4-way High Definition SIP/H.323 MultiSite
- Full Individual audio and video transcoding up to 1080p30
- Individual layouts in MultiSite CP (Takes out SelfView)
- H.323/SIP/VoIP in the same conference
- Best Impression (Automatic CP Layouts)

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**Contents**
- Introduction
- Technical specifications
- About monitors
- Audio matters
- Appendices
- Contact us
TANDBERG Codec C90, continued...

H.264, Encryption, Dual Stream from any site
IP Downspeeding
Dial in/Dial out
Conference rates up to 10 Mbps

PROTOCOLS
H.323
SIP

EMBEDDED ENCRYPTION
H.323/SIP point-to-point and multipoint calls
Standards-based: H.235 v2 & v3 and AES
Automatic key generation and exchange
Supported in Dual Stream & MultiSite

IP NETWORK FEATURES
DNS lookup for service configuration
Differentiated Services (QoS)
IP adaptive bandwidth management (including flow control)
Auto gatekeeper discovery
Dynamic playout and lip-sync buffering
H.245 DTMF tones in H.323
Date and Time support via NTP
Packet Loss based Downspeeding
URI Dialing
TCP/IP
DHCP
Direct DNS dialing
802.1x network authentication

SECURITY FEATURES
Management via HTTPS and SSH
IP Administration Password
Menu Administration Password
Disable IP services
Network Settings protection

NETWORK INTERFACES
2** x separate LAN/Ethernet (RJ-45) 10/100/1000 Mbit

GPIO
GPIO—General purpose Input/Output

OTHER INTERFACES
USB host for future usage
USB device for future usage

PRECISIONHD 1080P CAMERA
1/3" CMOS
12 x zoom
+15'/-25' tilt, +/- 90° pan
43.5° vertical field of view
72° horizontal field of view
Focus distance 0.3m–infinity
1920 x 1080 pixels progressive @ 60fps
Other formats supported (configurable through Dip-switch):
1920 x 1080@60 Hz (HDMI only)
1920 x 1080@50 Hz (HDMI only)
1920 x 1080@30 Hz
280 x 720@60 Hz
280 x 720@50 Hz
1280 x 720@30 Hz
1280 x 720@25 Hz
Automatic or manual focus/brightness/whitebalance
Far-end camera control
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Support for Local directories (My Contacts)
Corporate Directory
Unlimited entries using Server directory supporting LDAP and H.350
Unlimited number for Corporate directory (through TMS)
200 number local directory
Received Calls
Placed Calls
Missed Calls with Date and Time

POWER
Auto-sensing power supply
100–240 VAC, 50/60 Hz
175 watts max. for codec and main camera

OPERATING TEMPERATURE AND HUMIDITY
0° C to 35° C (32° F to 95° F) ambient temperature
10% to 90% Relative Humidity (RH)

STORAGE AND TRANSPORT TEMPERATURE
-20° C to 60° C (-4° F to 140° F) at RH 10–90% (non-condensing)

APPROVALS
Directive 2006/95/EC (Low Voltage Directive)— Standard EN 60950-1
Approved according to UL 60950-1 and CSA 60950-1-07
Complies with FCC15B Class B

DIMENSIONS
Length: 17.36in/44.1cm
Height: 3.67in/9.3cm
Depth: 11.8in/30cm

WEIGHT
Weight: 11.22 lbs/5.1kg

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