

**TANDBERG**

**TC**

## Software Release Notes

**Software Version TC1**

**D14359 Revision 8**

**July 2009**

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## Document Revision History

Revision 8	Release of TC1.2.1, Minor Patch Version
Revision 7	Release of TC1.2.0, dot release
Revision 6	Release of TC1.0.4, Minor Patch Version for T3
Revision 5	Release of TC1.1.2, Minor Patch Version
Revision 4	Release of TC1.1.1, Minor Patch Version
Revision 3	Release of TC1.1.0 and TC1.0.2 dot release
Revision 2	Release of TC1.0.1, Minor Patch Version
Revision 1	Release of TC1.0.0, Initial Version

## SOFTWARE RELEASE NOTES FOR TANDBERG CODEC SOFTWARE VERSION TC1.2.1

### Introduction

This release note describes the new features and capabilities included in the TANDBERG Codec software version TC1.2.1 released on 10th of July 2009.

**Note:** This software applies to endpoints that run the TC series of software. The TANDBERG MXP endpoints do not run TC software, but rather F or L series software. Statements and functionality in this release note does not apply to the TANDBERG MXP systems. Please see the Software Release Document for F and L series software. The TANDBERG T3 systems must run the software version specified in the TANDBERG TCU release notes.

### Changes and Improvements since Previous Version

#### Video

- Video encoder improvements to prevent codec crash [Ref. #62803].

#### Camera

With TC1.2.1 release the PrecisionHD 1080p camera will automatically be upgraded to software ID40043. Included in this release is:

- Using 2<sup>nd</sup> focus offset to get better zoom/focus tracking, if it has been set.
- Improvements related to switching between presets in T3.
- Tuning of the temporal noise filter's strength to minimize trailing artifacts.

#### Network

- Corrected an issue causing the codec to ignore H323 flowcontrol messages [Ref. #65405].

### Known Limitations

#### TANDBERG

<i>Ref. ID</i>	<i>Equipment</i>	<i>Limitations</i>
N/A	Ver. TC1.2.1	The UXGA (1600 x 1200) resolution is currently not supported.
N/A	Ver. TC1.2.1	The VGA (640 x 480) resolution is currently not supported.
62204	TANDBERG PrecisionHD 1080p Camera Ver. ID:40043	Currently the only formats supported by the HD-SDI output of the PrecisionHD 1080p Camera is 1080p30, 1080p25, 720p60, 720p30 and 720p50.
57452	Ver. TC1.2.1	It is possible for some monitors to over-scan the output

	(Overscan \ Video)	of the C90 endpoint, thus displaying the administrative menus off screen. To resolve this issue, it is recommended to change the video output resolution of the C90 to a more compatible monitor resolution.
	Ver TC1.2.1	Ethernet speed cannot be enforced. At this time only auto negotiation is supported.
63659	Ver TC1.2.1	Composite out will not give proper video output when the receiving video from far end in a video call is one of the following formats: w288p, CIF, 448p or QCIF
	Ver TC1.2.1	Startup scripts will not work with Windows end of line. You must use Unix end of line to be able to run multiple commands. Most editors has the option to set which format to use. If you use Notepad ++, you can set Unix format in the Settings/Preferences menu.

**References**

TANDBERG Website <http://www.tandberg.com>  
 TANDBERG FTP Site <http://ftp.tandberg.com>

For all documentation, please see the TANDBERG Support Website at <http://www.tandberg.com/support/documentation.php>

# SOFTWARE RELEASE NOTES FOR TANDBERG CODEC SOFTWARE VERSION TC1.2.0

## Introduction

This release note describes the new features and capabilities included in the TANDBERG Codec software version TC1.2.0 released on 12th of June 2009.

**Note:** This software applies to endpoints that run the TC series of software. The TANDBERG MXP endpoints do not run TC software, but rather F or L series software. Statements and functionality in this release note does not apply to the TANDBERG MXP systems. Please see the Software Release Document for F and L series software. The TANDBERG T3 systems must run the software version specified in the TANDBERG TCU release notes.

## Changes and Improvements since Previous Version

### Video

- Corrected an issue causing H.239 to fail after starting and stopping it twice when registered directly to a VCS Express [Ref. #64054].
- Corrected an issue which rarely could cause some monitors to display a green image when connected over HDMI or DVI [Ref. #61291].
- Video encoder improvements to reduce video bursts.

### Support for more languages

- Added support for Simplified Chinese language.
- Added support for Spanish language.
- Added support for Korean language.

### Camera

With TC1.2.0 release the PrecisionHD 1080p camera will automatically be upgraded to software ID40042. Included in this release is:

- Modified the table determination which pan speed to use for a given zoom level. The camera should now pan slower than before and be easier to adjust.
- Improvements to single stepping of pan (used for fine tune of presets in T3).
- First and last line of image used to be a bit brighter than the rest of the image. This issue is fixed.
- Added support for ITU-R BT.709 gamma curve.
- Major update of auto-exposure, which in most situations will give a significantly brighter image.
- Corrected an issue which could cause the camera to not move, if controlled through the internal IR receiver on the system it was attached to.



**Network**

- Corrected an issue causing audio packets to not be marked with DiffServ after a power cycle [Ref. #63419].

**Audio**

- Added support for ‘telephone add on’ for C90s used in a T3 system [Ref. #62400].

**New API commands:**

- *xstatus audio module*, to list status of connected DNAM [Ref. #59593].
- *xConfiguration Network 1 TrafficControl Mode: <on/off>*, default value is on. When set to on, the system will be less bursty.

**Misc**

- Corrected an issue with the timestamp of the Missed Calls displayed on the screen when otherwise idle to be incorrect [Ref. #62469].
- Corrected an issue causing the layout in the Layout Control menu of the system to display incorrect layout when compared to what is actually being displayed. This was evident when sending a presentation to the far end site.

**Known Limitations**

**TANDBERG**

<i>Ref. ID</i>	<i>Equipment</i>	<i>Limitations</i>
N/A	Ver. TC1.2.0	The UXGA (1600 x 1200) resolution is currently not supported.
N/A	Ver. TC1.2.0	The VGA (640 x 480) resolution is currently not supported.
62204	TANDBERG PrecisionHD 1080p Camera Ver. ID:40042	Currently the only formats supported by the HD-SDI output of the PrecisionHD 1080p Camera is 1080p30, 1080p25, 720p60, 720p30 and 720p50.
57452	Ver. TC1.2.0 (Overscan \ Video)	It is possible for some monitors to over-scan the output of the C90 endpoint, thus displaying the administrative menus off screen. To resolve this issue, it is recommended to change the video output resolution of the C90 to a more compatible monitor resolution.
	Ver TC1.2.0	Ethernet speed cannot be enforced. At this time only auto negotiation is supported.
63659	Ver TC1.2.0	Composite out will not give proper video output when the receiving video from far end in a video call is one of the following formats: w288p, CIF, 448p or QCIF
	Ver TC1.2.0	Startup scripts will not work with Windows end of line. You must use Unix end of line to be able to run multiple commands. Most editors has the option to set which format to use. If you use Notepad ++, you can set Unix format in the Settings/Preferences menu.

## References

TANDBERG Website <http://www.tandberg.com>  
TANDBERG FTP Site <http://ftp.tandberg.com>

For all documentation, please see the TANDBERG Support Website at <http://www.tandberg.com/support/documentation.php>

# SOFTWARE RELEASE NOTES FOR TANDBERG C90 SOFTWARE VERSION TC1.1.2

## Introduction

This release note describes the new features and capabilities included in the TANDBERG C90 software version TC1.1.2 released on 3rd of April 2009.

**Note:** This software applies to endpoints that run the TC series of software. The TANDBERG MXP endpoints do not run TC software, but rather F or L series software. Statements and functionality in this release note does not apply to the TANDBERG MXP systems. Please see the Software Release Document for F and L series software. The TANDBERG T3 systems must run the software version specified in the TANDBERG TCU release notes.

## Changes and Improvements since Previous Version

### Video

- Corrected an issue causing the composite output to only output near end video. The composite output can now be set to act as either first or second monitor [Ref. #60108]. This output still has some limitations listed in the Known Limitations section below.

### Audio

- Corrected an issue where occasionally when dialing into a Codian MCU under heavy load, the system would select wrong audio codec and cause a buzzing noise [Ref. #67267].
- Corrected an issue which could cause the dial tone to be heard a few seconds after connect [Ref. #63302]
- Implemented support for call type telephone using H.323. To place a telephone call, select "Audio call" as call rate.

### Network

- Improved DHCP handling. The DHCP client will now ARP the address given by the DHCP server, if any other clients reports that this address is taken, the DHCP client will send a DHCP DECLINE message [Ref. #63046].

## Known Limitations

### TANDBERG

<i>Ref. ID</i>	<i>Equipment</i>	<i>Limitations</i>
N/A	TANDBERG C90 Ver. TC1.1.2	The UXGA (1600 x 1200) resolution is currently not supported.
N/A	TANDBERG C90 Ver. TC1.1.2	The VGA (640 x 480) resolution is currently not supported.
N/A	TANDBERG PrecisionHD 1080p Camera Ver. ID:40035 (HD-SDI Output)	Currently the HD-SDI supports all 1080p and 720p formats apart from 720p50.
57452	TANDBERG C90 Ver. TC1.1.2 (Overscan \ Video)	It is possible for some monitors to over-scan the output of the C90 endpoint, thus displaying the administrative menus off screen. To resolve this issue, it is recommended to change the video output resolution of the C90 to a more compatible monitor resolution.
	TANDBERG C90 Ver TC1.1.2	Ethernet speed cannot be enforced. At this time only auto negotiation is supported.
63659	TANDBERG C90 Ver TC1.1.2	Composite out will not give proper video output when the receiving video from far end in a video call is one of the following formats: w288p, CIF, 448p or QCIF
	TANDBERG C90 Ver TC1.1.2	Startup scripts will not work with Windows end of line. You must use Unix end of line to be able to run multiple commands. Most editors has the option to set which format to use. If you use Notepad ++, you can set Unix format in the Settings/Preferences menu.

### References

TANDBERG Website <http://www.tandberg.com>  
 TANDBERG FTP Site <http://ftp.tandberg.com>

For all documentation, please see the TANDBERG Support Website at <http://www.tandberg.com/support/documentation.php>

# SOFTWARE RELEASE NOTES FOR TANDBERG C90 SOFTWARE VERSION TC1.1.1

## Introduction

This release note describes the new features and capabilities included in the TANDBERG C90 software version TC1.1.1 released on 19<sup>th</sup> of March 2009.

**Note:** This software applies to endpoints that run the TC series of software. The TANDBERG MXP endpoints do not run TC software, but rather F or L series software. Statements and functionality in this release note does not apply to the TANDBERG MXP systems. Please see the Software Release Document for F and L series software.

### Camera Software Upgrade

TC1.1.1 software will automatically upgrade the PrecisionHD 1080p camera to software version S01718-4.0Final [ID:40035] when connected to the C90 Camera Control port, which is highlighted in orange for TANDBERG basic cable connections. A camera upgrade status window will appear on screen 30 seconds after the codec restarts after the endpoint software upgrade. The PrecisionHD 1080p camera will restart automatically once the software is loaded resulting in no video for 15 seconds.

**Note:** It may be possible that the PrecisionHD 1080p camera is not detected after the camera has been upgraded. Power cycle the camera or system to re-establish communication to the camera.

## Changes and Improvements since Previous Version

### Video

- Added robustness in the way the video decoder determines when data for a whole video frame is available. This will improve the video when dialling ISDN gateways like the TANDBERG MPS Gateway [Ref. #62020].

### Camera

With TC1.1.1 release the PrecisionHD 1080p camera will automatically be upgraded to software ID40035. Included in this release is:

- Corrected an issue with defect pixel correction.
- Corrected an issue with HD-SDI output not working at the same time as HDMI when camera dip switches is set to auto. When the camera is set to auto both HDMI and HD-SDI will now work as expected.

### MISC

- Corrected DiffServ to work with UDP traffic as well as TCP [Ref. #62094].
- Fixed an issue with 802.1x where a blank string was sent as ID if anonymous identity was not set.

## Known Limitations

### TANDBERG

<i>Ref. ID</i>	<i>Equipment</i>	<i>Limitations</i>
N/A	TANDBERG C90 Ver. TC1.1.0	The UXGA (1600 x 1200) resolution is currently not supported.
N/A	TANDBERG C90 Ver. TC1.1.0	The VGA (640 x 480) resolution is currently not supported.
N/A	TANDBERG PrecisionHD 1080p Camera Ver. ID:40031 (HD-SDI Output)	Currently the HD-SDI supports all 1080p and 720p formats apart from 720p50.
57452	TANDBERG C90 Ver. TC1.1.0 (Over Scan \ Video)	It is possible for some monitors to over-scan the output of the C90 endpoint, thus displaying the administrative menus off screen. To resolve this issue, it is recommended to change the video output resolution of the C90 to a more compatible monitor resolution.
	TANDBERG C90 Ver TC1.1.0	Ethernet speed cannot be enforced. At this time only auto negotiation is supported.
61998	TANDBERG C90 Ver TC1.1.0	Composite output does not display far end video.

### References

TANDBERG Website <http://www.tandberg.com>  
 TANDBERG FTP Site <http://ftp.tandberg.com>

For all documentation, please see the TANDBERG Support Website at <http://www.tandberg.com/support/documentation.php>

## SOFTWARE RELEASE NOTES FOR TANDBERG C90 SOFTWARE VERSION TC1.1.0

### Introduction

This release note describes the new features and capabilities included in the TANDBERG C90 software version TC1.1.0 released on 15<sup>th</sup> of February 2009.

**Note:** This software applies to endpoints that run the TC series of software. The TANDBERG MXP endpoints do not run TC software, but rather F or L series software. Statements and functionality in this release note does not apply to the TANDBERG MXP systems. Please see the Software Release Document for F and L series software.

#### Camera Software Upgrade

TC1.1.0 software will automatically upgrade the PrecisionHD 1080p camera to software version S011718-4.0Final [ID:40032] when connected to the C90 Camera Control port, which is highlighted in orange for TANDBERG basic cable connections. A camera upgrade status window will appear on screen 30 seconds after the codec restarts after the endpoint software upgrade. The PrecisionHD 1080p camera will restart automatically once the software is loaded resulting in no video for 15 seconds. For a description of improvements of this camera release, please have a look at the TC1.0.2 section of this document.

**Note:** It may be possible that the PrecisionHD 1080p camera is not detected after the camera has been upgraded. Power cycle the camera or system to re-establish communication to the camera.

### New Product Abstract

#### TANDBERG C60

The TC 1.1.0 release introduces support for the new Codec C60, the 1080p HD Team Collaboration Engine. This codec will provide you with exceptional 1080p HD video, power and control for integration into every team room, boardroom or industry application. For more information please visit: <http://www.tandberg.com>, where user manual, technical specifications and administrator guide will be available for download.

**NOTE:** The TANDBERG Codec C60 can not run software versions lower then TC 1.1.0



Figure 1: TANDBERG Codec C60.

## New Features

### 802.1x support

802.1x is a port-based low-layer method of authentication and authorization. Upon implementation of 802.1x, the network can now automatically provide the endpoint specific network access, including specific VLAN, link properties and other criteria allowing the network to protect itself and all other devices present.

### WSXGA+ on DVI-D, enc/dec

Support for WSXGA+ (1680x1050) when connected to the system using a digital connection. To utilize this resolution you will have to have a computer with a DVI, Display Port or HDMI output. All of these connections are compatible with the digital HDMI and DVI inputs of the codec. Typically you would connect your computer to the default DVI PC input.

### Set time, date and time zone from the Graphical User Interface (GUI)

These settings are now available under the System Settings Menu.

### Support for more languages

#### *Japanese*

Japanese language is now supported in main parts of the GUI. The Advanced Configuration menu is not translated and hence will still be displayed in English.

#### *French*

French language is now supported in main parts of the GUI. The Advanced Configuration menu is not translated and hence will still be displayed in English.

#### *Russian*

Russian language is now supported in main parts of the GUI. The Advanced Configuration menu is not translated and hence will still be displayed in English.

### Menu password

A menu password can now be set to protect the Administrator Settings Menu. Once set, only typical user settings can be edited by the general user.

### Improved interoperability

Multiple interoperability issues have been resolved in this release, including H.239 issues towards Polycom. Please have a look at the interoperability section of this document for a complete interoperability overview.

### Packet loss concealment

When packet loss is detected the receiving side will use various techniques to hide the impact of packet loss. This will increase the robustness and the quality of the video in the event of packet loss should occur.



## Easy access to main video sources from GUI

Main video sources are now moved out of the Administrator menu for access by the general user in the System Settings Menu. In addition video sources will be available from a softkey visible when moving the camera.

## Added support for component (YPrPb) input over DVI-A

To get this to work you must configure the input for component video. This can be done from the Graphical User Interface (GUI) or from the API using the command: xConfiguration Video Input DVI [x] Type: AnalogYPbPr

X = DVI input number.

## Added support for startup script

The startup script can be used to execute certain commands from the API during boot up. To enable this feature one must log in as root and follow the below points:

1. Make a user directory using the following command: "mkdir /user/scripts.d"
2. Put an executable file (permission must be changed to executable) in this directory. Example of such a file:  

```
#!/usr/bin/env tsh
xCommand Audio LocalInput Update InputId: 1 MixerMode:Fixed
```
3. The file must start with the sequence. "#!/usr/bin/env tsh"
4. The file can contain any Xcommand or Xconfiguration
5. The system will execute the commands/configurations in sequence.
6. The file can have any name as long as it is placed in this directory.
7. For multiple commands you must use Unix end of line (LF). Windows end of line will not work.

## API/XML

### New xCommands

- Xcommand SystemUnit DateTime Set
- Xcommand Systemunit DateTime Set
- Xcommand Experimental Camera DirectIRControl

### New xConfigurations

- Xconfiguration SystemUnit MenuLanguage
- Xconfiguration Network 1 IEEE8021X Mode
- Xconfiguration Network 1 IEEE8021X AnonymousIdentity
- Xconfiguration Network 1 IEEE8021X Identity
- Xconfiguration Network 1 IEEE8021X Password
- Xconfiguration Network 1 IEEE8021X Eap Md5
- Xconfiguration Network 1 IEEE8021X Eap Ttls

- Xconfiguration Network 1 IEEE8021X Eap Peap
- Xconfiguration Video Output HDMI [..] MonitorRole: <First/Second>
- Xconfiguration Video Output DVI [..] MonitorRole: <First/Second>
- Xconfiguration Video Output Composite [..] MonitorRole: <First/Second>
- xConfiguration Video Input DVI [..] Type: <AutoDetect/Digital/AnalogRGB/AnalogYPbPr>

#### **Removed xCommands/Xconfigurations**

- Xcommand Camera DirectIRControl (replaced with new command, see above)
- Xcommand Experimental SetExperiaMode

## Changes and Improvements since Previous Version

### Video

- Corrected the brightness mode for the Camera, which did not survive a reboot [Ref. #57299].
- Corrected an issue with analogue input on DVI-5 [Ref. #57390].
- Corrected possible black video from HD-SDI when re-connecting video devices [Ref. #59316].
- Corrected an instance where received dual stream would be displayed as black video [Ref. #61326]
- Corrected an issue where toggling dual stream between far end and near and would cause the system to display a 16/9 layout when receiving a 4/3 presentation (Ref. #59733)

### User Interface

- Name entries in the GUI will now have the first entry as a capital letter [Ref. #54729].
- Added protocol and call rate to the system information menu [Ref. #55472]
- Increased size of New Contact window under My Contacts [Ref. #56247].
- Increased the size of the URL input fields under administrator settings [Ref. #56788]

### API / XML

- Corrected an issue with 'xStatus Audio' where updates were not reflected on the API [Ref. #56118].
- Improvements to logging which now implement important messages when system logs are captured [Ref. # 59125].
- xCommand Call Disconnect command now requires CallID.

### Audio

- Changed audio codec policy. You will no longer use 128kbps AAC-LD audio in a 256kbps video call. New policy
  - G722.1 preferred up to 256kbps.
  - AAC-LD 64kbps preferred from 256kbps to 512kbps.
  - AAC.LD 128kbps preferred from 512kbps and above.

### MISC

- Enabled the Alarm LED on the front of the codec [Ref- #57414].
- Fixed an issue preventing the unit to start up if no DHCP server was available and the system was set to DHCP mode [Ref. #57463]
- Fixed Far End Camera Control (FECC). An issue has been resolved, which prevented you from controlling other cameras then the main camera.

## Known Limitations

### TANDBERG

<i>Ref. ID</i>	<i>Equipment</i>	<i>Limitations</i>
N/A	TANDBERG C90 Ver. TC1.1.0	The UXGA (1600 x 1200) resolution is currently not supported.
N/A	TANDBERG C90 Ver. TC1.1.0	The VGA (640 x 480) resolution is currently not supported.
N/A	TANDBERG PrecisionHD 1080p Camera Ver. ID:40031 (HD-SDI Output)	Currently the HD-SDI supports all 1080p and 720p formats apart from 720p50.
57452	TANDBERG C90 Ver. TC1.1.0 (Over Scan \ Video)	It is possible for some monitors to over-scan the output of the C90 endpoint, thus displaying the administrative menus off screen. To resolve this issue, it is recommended to change the video output resolution of the C90 to a more compatible monitor resolution.
58554	TANDBERG C90 Ver TC1.1.0 (TANDBERG MCU Ver. D3.10 & MPS Ver. J4.3 \ 720p HD Video)	Currently there is distorted video displayed on the C90 during a TANDBERG MCU and TANDBERG MPS conference at 720pHD video.
	TANDBERG C90 Ver TC1.1.0	Ethernet speed cannot be enforced. At this time only auto negotiation is supported.
61998	TANDBERG C90 Ver TC1.1.0	Composite output does not display far end video.
62094	TANDBERG C90 Ver TC1.1.0	Diffserv currently does not mark the UDP packets

### References

TANDBERG Website <http://www.tandberg.com>  
 TANDBERG FTP Site <http://ftp.tandberg.com>

For all documentation, please see the TANDBERG Support Website at <http://www.tandberg.com/support/documentation.php>

## Interoperability Testing

The following systems have been tested and verified compatible with this software release.

### H.323 Gatekeepers/Traversal Servers

<i>Equipment</i>	<i>Software Revision</i>	<i>Comments</i>
TANDBERG Gatekeeper	N6.1	
TANDBERG Border Controller	Q6.1	Both Assent and H.460.18/.19 traversal technologies are supported
TANDBERG Video Communication Server (VCS)	X3.0, X3.1	Both Assent and H.460.18/.19 traversal technologies are supported

### SIP Registrars/Proxies

<i>Equipment</i>	<i>Software Revision</i>	<i>Comments</i>
TANDBERG Video Communication Server (VCS)	X3.0, X3.1	

### Gateway Interoperability

<i>Equipment</i>	<i>Software Revision</i>	<i>Comments</i>
TANDBERG MPS Gateway	J4.3	See Known Limitations Sections Ref. # 58555.
TANDBERG Gateway	G3.2	See Known Limitations Sections Ref. # 58555.

### MCU Interoperability

<i>Equipment</i>	<i>Software Revision</i>	<i>Comments</i>
TANDBERG MPS	J4.3	
TANDBERG MCU	D3.10	
TANDBERG\Codian 4210	2.4(1.10)	
TANDBERG\Codian 4505	2.4(1.10)	
Polycom MGC50	9.0.1.8	<p>When there is 3 or more C90/C60 in a MGC conference, no matter which call rate, one site would go into a faulty connection and loose video and after a few minutes display green video with lines. 2 codec in a conference were stable (Ref. #61956)</p> <p>During a 384k conf, when H239 is started or H239 hand off is initiated, this causes an issue with the MGC which causes the other sites video to drop, or the call will drop to an audio call (Ref. # 61957).</p> <p>In a 128kbps Continuous Presence</p>

		conference no video is displayed (Ref. #61958).
Polycom RMX2000	3.00.94	Standard Definition video works fine. H.239 is sometimes unstable. High Definition video resolutions cause various issues and is not recommended at this point.

### Streaming Servers

<i>Equipment</i>	<i>Software Revision</i>	<i>Comments</i>
TANDBERG Content Server	S3.1	

### Endpoint Interoperability

<i>Equipment</i>	<i>Software Revision</i>	<i>Protocol</i>	<i>Comments</i>
TANDBERG MXP	F7.2	H323	
TANDBERG MXP	F7.2	SIP	
TANDBERG Personal Series	L5.1	H323	
TANDBERG Personal Series	L5.1	SIP	
TANDBERG Classic	E5.3/B10.3	H323	
LifeSize Express	LS_EX1_4.0.0(0)	H323	Dual Stream is limited to 4fps
LifeSize Room	LS_EX1_4.0.0(0)	H323	Dual Stream is limited to 4fps
Polycom VSX 3000	8.5.3	H323	Dual stream not tested (H.239)
Polycom VSX 3000	8.5.3	SIP	Dual stream not tested (H.239)
Polycom VSX 7000	8.5.3	H323	FECC works from C90/C60 but not the other way around
Polycom VSX 7000	8.5.3	SIP	FECC does not work
Polycom VSX 7000	9.0.1	H323	Dual stream (H.239) unstable at 256kbps or below.
Polycom VSX 8000	8.7.1	H323	
Polycom VSX 8000	8.7.1	SIP	FECC does not work
Sony PCS-1	03.41	H323	Dual stream is limited to 1 FPS.
Sony PCS-g70	02.69	H323	Dual stream is limited to 1 FPS.
Sony PCS TL50	02.21	H323	Dual stream is limited to 1 FPS.
Sony PCS XG80	02.01.00	H323	Dual stream low frame rates on lower bandwidths but work great from 768kbps and above.
Polycom FX	6.0.5.17	H323	
Polycom HDX 8000	2.0.2-235	H323	2CIF from Polycom is not detected as anamorphic and

		3	hence will cause a thin too high image. This is scheduled to be fixed in a later release. Call rates above 768kbps will not see this issue.
Polycom HDX 8000	2.0.2-235	SIP	2CIF from Polycom is not detected as anamorphic and hence will cause a thin too high image. This is scheduled to be fixed in a later release. Far End Camera Control (FECC) is not supported over SIP. Call rates above 768kbps will not see this issue.
Polycom HDX 9004	2.0.3-2728	H323	2CIF from Polycom is not detected as anamorphic and hence will cause a thin too high image. This is scheduled to be fixed in a later release. Call rates above 768kbps will not see this issue.
Polycom HDX 9004	2.0.3-2728	SIP	2CIF from Polycom is not detected as anamorphic and hence will cause a thin too high image. This is scheduled to be fixed in a later release. Far End Camera Control (FECC) is not supported over SIP. Call rates above 768kbps will not see this issue.
Polycom HDX 9004	2.5.0.1-3332	H323	

## SOFTWARE RELEASE NOTES FOR TANDBERG C90 SOFTWARE VERSION TC1.0.4

### Introduction

This release note describes the new features and capabilities included in the TANDBERG C90 software version TC1.0.4 released on 7<sup>th</sup> of April 2009. The release includes minor fixes required for the TANDBERG T3 telepresence system. There is no need to upgrade none TANDBERG T3 systems to TC1.0.4.

**Note:** This software applies to endpoints that run the TC series of software. The TANDBERG MXP endpoints do not run TC software, but rather F or L series software. Statements and functionality in this release note does not apply to the TANDBERG MXP systems. Please see the Software Release Document for F and L series software.

### Changes and Improvements since Previous Version

#### Video

- Added more robustness to the video decoder. Packets arriving out of order and outside of the jitter buffer, will be dropped
- Fixed an issue which could cause the Presentation channel to establish with too low bandwidth causing blurry images.

#### Network

- Disabled path MTU for media. If MTU is too large for the network causing fragmentation, the network will now be instructed to notify the endpoint, which will reduce the MTU size to avoid fragmentation.
- Implemented jitter buffer based upon audio and video jitter. Previously only audio was used to build up the jitter buffer. This will provide better video when video packets arrive out of order within the jitter buffer, as the unit will be able to re-order the packets before they are fed to the decoder.
- Implemented support for IEEE 802.1X. 802.1X

#### New xCommands:

- *xConfiguration Network 1 IEEE8021X Mode: Off*
- *xConfiguration Network 1 IEEE8021X AnonymousIdentity: ""*
- *xConfiguration Network 1 IEEE8021X Identity: ""*
- *xConfiguration Network 1 IEEE8021X Password: ""*
- *xConfiguration Network 1 IEEE8021X Eap Md5: On*
- *xConfiguration Network 1 IEEE8021X Eap Ttls: On*
- *xConfiguration Network 1 IEEE8021X Eap Peap: On*



**Audio**

- Implemented support for telephone add on connected to the T3 center codec using line input x and line output 4.

## SOFTWARE RELEASE NOTES FOR TANDBERG C90 SOFTWARE VERSION TC1.0.2

### Introduction

This release note describes the new features and capabilities included in the TANDBERG C90 software version TC1.0.2 released on 15<sup>th</sup> of February 2009. The release includes minor fixes required for the TANDBERG T3 telepresence system. There is no need to upgrade none TANDBERG T3 systems to TC1.0.2.

**Note:** This software applies to endpoints that run the TC series of software. The TANDBERG MXP endpoints do not run TC software, but rather F or L series software. Statements and functionality in this release note does not apply to the TANDBERG MXP systems. Please see the Software Release Document for F and L series software.

### Camera Software Upgrade

TC1.1.0 software will automatically upgrade the PrecisionHD 1080p camera to software version S011718-4.0Final [ID:40031] when connected to the C90 Camera Control port, which is highlighted in orange for TANDBERG basic cable connections. A camera upgrade status window will appear on screen 30 seconds after the codec restarts after the endpoint software upgrade. The PrecisionHD 1080p camera will restart automatically once the software is loaded resulting in no video for 15 seconds.

**Note:** It may be possible that the PrecisionHD 1080p camera is not detected after the camera has been upgraded. Power cycle the camera or system to re-establish communication to the camera.

## Changes and Improvements since Previous Version

### Video

- Corrected the possibility of black video being sent to far end caused by a glitch on the local video input [Ref. # 57723].
- Added possibility to turn off white borders around video frames displayed using the experimental video API. New parameter 'border: <on/off>' added to the commands 'xCommand Experimental Video Layout Frame Add' and 'xCommand Experimental Video Layout Frame Update'.
- Corrected an issue where the encoder would stop getting data and hence no video was sent to the far end site [Ref. #61402]
- Corrected a possible reboot caused by the still image decoder [Ref. #61042]
- Implemented a mechanism to refresh the entire sent image every 5 minutes. This is done to improve the robustness in instances where a coder/decoder mismatch has occurred.

## Camera

With TC1.0.2 release the PrecisionHD 1080p camera will automatically be upgraded to software ID40032. Included in this release is:

- HD-SDI now supports all 1080p and 720p formats apart from 720p50.
- Improvements to the HDMI driver, especially the HDMI start-up sequence.
- Fixed an issue causing the top and bottom image edges to be brighter than the rest of the image.
- Increased speed when only using zoom from the remote control.
- Improved robustness for the daisy chain link used when connecting more than 1 camera.
- Improved auto focus

**Note:** It may be possible that the Precision HD camera is not detected after the camera has been upgraded. Power cycle the camera or system to re-establish communication to the camera.

## Audio

- Adjusted DNAM equalizer filters for T1 and T3 speakers.
- Turned off center DNAM delay in true mono. This will increase the audio quality for mono calls.
- Adjusted audio equalizer to match the microphones used for the TANDBERG T3 Telepresence system.
- Adjusted audio levels for TANDBERG T3 video systems to equalize audio levels between T3 systems and added briefers.

# SOFTWARE RELEASE NOTES FOR TANDBERG C90 SOFTWARE VERSION TC1.0.1

## Introduction

This release note describes the new features and capabilities included in the TANDBERG C90 software version TC1.0.1 released on 27 November 2008.

**Note:** This software applies to endpoints that run the TC series of software. The TANDBERG MXP endpoints do not run TC software, but rather F or L series software. Statements and functionality in this release note does not apply to the TANDBERG MXP systems. Please see the Software Release Document for F and L series software.

### Camera Software Upgrade

TC1.0.1 software will automatically upgrade the PrecisionHD 1080p camera to software version S011718-4.0Final [ID:40024] when connected to the C90 Camera Control port, which is highlighted in orange for TANDBERG basic cable connections. A camera upgrade status window will appear on screen 30 seconds after the codec restarts after the endpoint software upgrade. The PrecisionHD 1080p camera will restart automatically once the software is loaded resulting in no video for 15 seconds.

**Note:** It may be possible that the PrecisionHD 1080p camera is not detected after the camera has been upgraded. Power cycle the camera or system to re-establish communication to the camera.

## Changes and Improvements since Previous Version

### Video

- Corrected the no video displayed when there was no HDMI cable connected during power up [Ref. # 58884].
- Corrected the possibility of black video from the HDMI and DVI-D inputs [Ref. # 58804].
- Corrected the possibility of the black video displayed when the HD-SDI cable is re-connected [Ref. # 59316].
- Corrected the possibility of black window appearing when the video input format is changed [Ref. # 58755].
- Improvements to the Experimental Video API, which could result in an unexpected restart [Ref. # 57561].
- 

### Camera

- Corrected a possible auto exposure issue that could enter into an infinite loop when trying to adjust exposure in some backlight scenarios [Ref. # 58564]

**Note:** It may be possible that the Precision HD camera is not detected after the camera has been upgraded. Power cycle the camera or system to re-establish communication to the camera.

## User Interface

- Corrected a memory leak within the User Interface application [Ref # 58612].

## API / XML

- Changed the status of the following command “xstatus SystemUnit software Version:” to now display “TC1.0.1.167691” [Ref. # N/A].
- Improvements to logging which now implement important messages when system logs are captured [Ref. # 59125].

## SOFTWARE RELEASE NOTES FOR TANDBERG C90 SOFTWARE VERSION TC1.0.0

### Introduction

This release note describes the new features and capabilities included in the TANDBERG C90 software version TC1.0.0 released on 15 November 2008.

**Note:** This software applies to endpoints that run the TC series of software. The TANDBERG MXP endpoints do not run TC software, but rather F or L series software. Statements and functionality in this release note does not apply to the TANDBERG MXP systems. Please see the Software Release Document for F and L series software.

### New Product Abstract

#### TANDBERG C90 Telepresence Engine

The C90 is a new addition to the TANDBERG endpoint line and is one of the most powerful, flexible telepresence and collaboration engines available. This critical innovation takes visual communication into the future, with the superior video clarity of 1080p high definition for the main and dual stream, ultra wideband audio, 720p and 1080p high definition MultiSite with individual transcoding. The C90 is very flexible to integrate with its multiple video and audio connections, all with industry standard connectors. The TANDBERG C90 comes with a new remote control, the TANDBERG TRC-V. This remote control is equipped with five function keys on the top, which will apply to various functions when navigating the menu system. The remote control has a selectable IR strength switch (within battery compartment) for short or long distances so multiple C90s are not controlled at the same time.



Figure 2: TANDBERG C90 Telepresence Engine & TANDBERG PrecisionHD 1080p Camera



Figure 3: TANDBERG TRC-V

**TANDBERG PrecisionHD 1080p camera**

The TANDBERG PrecisionHD 1080p camera is a new addition to the TANDBERG Precision camera line with a superior video clarity of 1080p@60Hz high definition video and 12x optical zoom.



- 1080p@60 (1920 x 1080)
- 16:9 video Aspect Ratio
- 12 x Zoom
- 72° Field of View
- 180° PAN
- Auto/Manual Focus, brightness, and White balance
- Same Camera Worldwide
- Best View
- Automatic flips image for ceiling mount
- Dual HD outputs HDMI and HD-SDI
- Resolution Dip Switch for HDMI and HD-SDI
- Software Upgradable from Codec

**Figure 4: TANDBERG PrecisionHD 1080p Camera**



**Figure 5: TANDBERG PrecisionHD 1080p Camera \ Back View**



**Figure 6: TANDBERG PrecisionHD 1080p Camera \ Ceiling Mount**

**Note:** The Ethernet port on the PrecisionHD 1080p camera is reserved for future use.

## New Features

### Video

#### High Definition Video

The TANDBERG C90 Telepresence Engine serves as the backend architecture of the TANDBERG Total Telepresence solution, supporting the full range of optimal resolutions, including 1920 x 1080 (1080p) at 30 frames per second (fps) in addition to 1280 x 720 (or 720p).

Availability: TANDBERG T3, TANDBERG T1, TANDBERG C90, TANDBERG C90 Integrator

Restrictions: During a 1080p call the Call Status will display the resolution of 1920x1088 for transmit and receive. 1080p is 1920\*1080 pixels, however to be able to code the image, the resolution must be dividable by 16. The picture is divided into macro blocks of 16\*16 pixels when coded, hence you will receive a resolution of 1920\*1088 instead of 1920\*1080.

Note! The codec will add 8 black lines at the bottom of the coded image. These lines will be removed again at the far end side. No scaling is used to accomplish this.

Premium Resolution Option required for 1080p.

#### H.264 Video over H.239

The C90 supports the ability to send an H.239 dual stream using the H.264 video protocol in addition to H.263 video protocol for backwards compatibility. The choice of video encoder for the H.239 stream is made based on the capabilities of the remote endpoint.

Availability: TANDBERG T3, TANDBERG T1, TANDBERG C90, TANDBERG C90 Integrator

Restrictions: None

#### High Definition over H.239

The C90 supports the ability of transmitting high definitions resolutions of 1280 x 720 (720p) and 1920 x 1080 (1080p) at 30fps, plus many other resolutions, providing for the highest quality resolution and motion used for the dual stream content. All dual stream resolutions are in addition to the primary stream resolutions of up to 1080p.

H.239 Supported Resolutions
1920 x 1080 (HD1080p30) @ 30fps
1280 x 720 (HD720p30) @ 30fps
1280 x 1024 (SXGA) @ 30fps
1024 x 768 (XGA) @ 30fps
800 x 600 (SVGA) @ 30fps

Availability: TANDBERG T3, TANDBERG T1, TANDBERG C90, TANDBERG C90 Integrator

Restrictions: Premium Resolution Option required for 1080p.

#### Best View (beta)

Best view is currently a technology preview. When activating this feature the camera will zoom all the way out, analyze the room and detect faces, it will then calculate the best view (image segment) for the amount of people in the room and position the camera accordingly.



Availability: TANDBERG T1, TANDBERG C90, TANDBERG C90 Integrator  
 TANDBERG Precision 1080p HD camera

Restrictions: This feature is currently a technology preview of the TANDBERG PrecisionHD 1080p Camera. Issues may be encountered during operation.

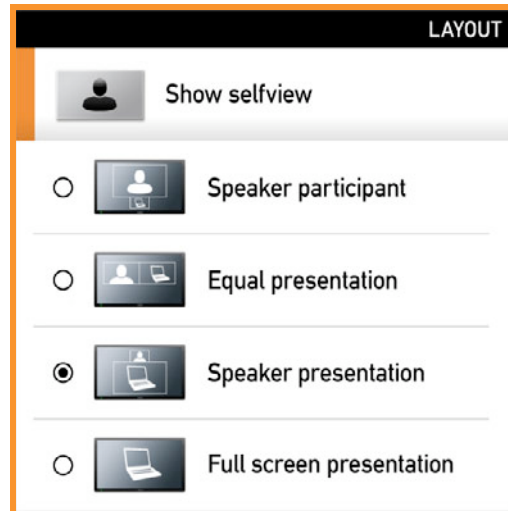
**Video Layouts**

The C90 supports dynamic video layouts that change depending on the call and status of the ongoing connection; and can also be manually changed by the user during both point-to-point and MultiSite conferences. The video layouts can be changed from the C90’s TRC-V remote control layout button.

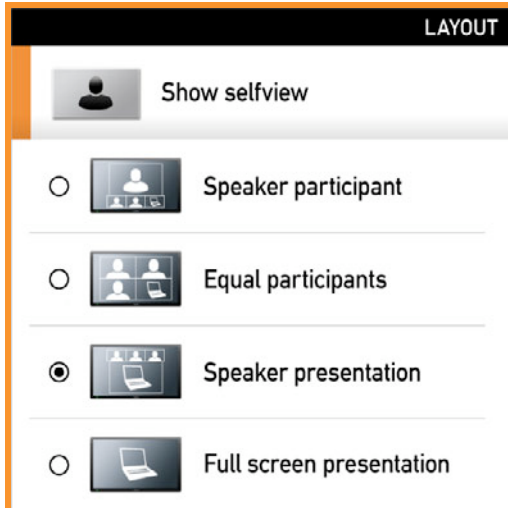
See below for some of the selectable video layouts during calls:



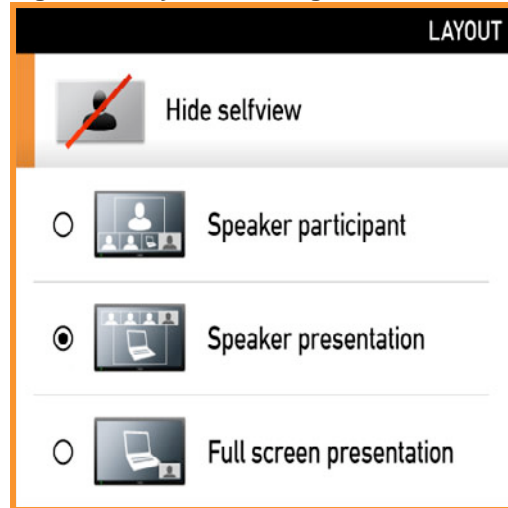
**Figure 7: TANDBERG TRC-V Layout button**



**Figure 8: Layouts During Call with H.239**



**Figure 9: Layouts from a MultiSite Host with H.239**



**Figure 10: Layouts from a MultiSite Host with Selfview and H.239**

Availability: TANDBERG T1, TANDBERG C90, TANDBERG C90 Integrator

Restrictions: MultiSite Option is required for Multisite Layouts to appear.

**Video inputs**

The C90 supports multiple video inputs from standard connectors like BNC, HDMI, and DVI-I, making it very flexible for integrations. The TANDBERG Basic Setup video input connections are highlighted in orange indicated on the C90's back plane. The Video Input Matrix indicates which 5 video connectors can be used at the same time.

Video inputs are all indicated in blue ■

- 2 x Component (YPrPb) using BNC connectors,
- 4 x HD-SDI (High Definition - Serial Digital Interface) using BNC Connectors
- 1 x Composite or 1\* S-video (Y/C) supporting both PAL and NTSC using BNC connector(s).
- 4 x HDMI Ver 1.3 (High Definition Media Interface)
- 2 x DVI-I (Digital Video Interface – Integrated Analog \ Digital Video)



**Figure 11: C90 Backplane \ Video Inputs**



**Figure 12: Video Input Matrix**

**Note:** Only 1 video source from each of these rows can be active at any time.

The supported input resolutions:

HDMI / DVI-D	DVI-A	HD-SDI	Component (YPrPb)	Composite
1920 x 1080 @ 60fps	1280 x 1024 (SXGA) @ 60fps, 75fps	1920 x 1080 @ 30fps	1920 x 1080 @ 60fps	720 x 576 (PAL) @ 25 fps (50 Hz)
1920 x 1080 @ 50fps	1024 x 768 (XGA) @ 60fps, 70fps, 75fps, 85fps	1920 x 1080 @ 25fps	1920 x 1080 @ 50fps	720 x 480 (NTSC) @ 30 fps (60 Hz)
1920 x 1080 @ 30fps	800 x 600 (SVGA) @ 56fps, 60fps, 72fps, 75fps, 85fps	1280 x 720 @ 60fps	1920 x 1080 @ 30fps	
1920 x 1080 @ 25fps		1280 x 720 @ 50fps	1920 x 1080 @ 25fps	
1920 x 1080 @ 24fps		1280 x 720 @ 30fps	1280 x 720 @ 60fps	
1280 x 720 @ 60fps		1280 x 720 @ 25fps	1280 x 720 @ 50fps	
1280 x 720 @ 50fps			720 x 576 @ 50fps	
720 x 480 @ 60fps			720 x 480 @ 60fps	

Availability: TANDBERG T1, TANDBERG C90, TANDBERG C90 Integrator  
 Restrictions: Audio is not supported on HDMI input 1 and 2  
 The resolutions of 1280 x 720 at 30 and 25fps are not supported on the HDMI / DVI-D inputs.  
 Composite/S-video is not enabled in first software release.

**Video outputs**

The C90 supports 5 video outputs of analog and digital video. The TANDBERG Basic Setup video output connections are highlighted in orange which is indicated on the C90's back plane.

Video Outputs indicated in red ■

- 2 x HDMI Ver 1.3 (High Definition Media Interface) Video + Audio output
- 2 x DVI-I (Digital Video Interface – Integrated Analog \ Digital Video)
- 1 x Composite PAL or NTSC BNC Connector



**Figure 13: C90 Backplane \ Video Outputs**

The supported output resolutions:

HDMI / DVI-D / DVI-A	Composite
1920 x 1080 (HD1080p60) @ 60fps	720 x 576 (PAL) @ 25 fps (50 Hz)
1280 x 720 (HD720p60) @ 60fps	720 x 480 (NTSC) @ 30 fps (60 Hz)
1366 x 768 (WXGA) @ 60fps	
1360 x 768 (WXGA) @ 60fps	
1280 x 768 (WXGA) @ 60fps	
1024 x 768 (XGA) @ 60fps	
1280 x 1024 (SXGA) @ 60fps	
800 x 600 (SVGA) @ 60fps	

Availability: TANDBERG T1, TANDBERG C90, TANDBERG C90 Integrator  
 Restrictions: Composite output does not display the user interface.

**Extended Display Identification Data (EDID)**

The C90 supports EDID version 1.3 on all DVI-I and HDMI video inputs. The video outputs support the ability of reading the EDID information of version 1.3 and use this information to determine the correct output resolution and refresh rate.

Availability: TANDBERG T1, TANDBERG C90, TANDBERG C90 Integrator  
 Restrictions: EDID information may not be supported on some monitor via the HDMI inputs.

## Audio

### Audio inputs

The C90 has 8 balanced Microphone/Line inputs that can be configured for Microphone or Line level, use of echo control and noise reduction. The 8 Microphone/Line input levels can also be adjusted or completely be disabled. The 4 RCA audio inputs can be enabled or disabled, their level settings can be adjusted and they can be configured for stereo or mono. The 4 RCA audio inputs also support a loop suppression to remove any audio loop that may occur when connected to recording devices. The audio inputs on the HDMI can be enabled or disabled. The TANDBERG Basic Setup audio inputs connections are highlighted in orange which is indicated on the C90's back plane.

Audio Inputs indicated in yellow ■

- 8 x Balanced Large XLR connectors
- 4 x RCA connectors
- 2 x HDMI



Figure 14: C90 Backplane \ Audio Inputs

Availability: TANDBERG T1, TANDBERG C90, TANDBERG C90 Integrator

Restrictions: Audio input is not supported on HDMI input 1 and 2.

### Audio outputs

The C90 has 4 RCA line level outputs that can be enabled/disabled, adjust levels settings, and configured for stereo or mono. These audio outputs can also be configured as 2 stereo pairs. Audio outputs 1 and 3 can also be configured for S/PDIF for digital stereo. The 2 balanced XLR outputs can be enabled / disabled, their level settings can be adjusted and they can be configured for stereo or mono. The audio outputs on the HDMI can be enabled or disabled. The TANDBERG Basic Setup audio outputs connections are highlighted in orange which is indicated on the C90's back plane

Audio Outputs indicated in bright green ■

- 4 x RCA connectors (1 and 3 outputs S/PDIF)
- 2 x Balanced Large XLR connectors
- 2 x HDMI



**Figure 15: C90 Backplane \ Audio Outputs**

**Note:** Setting S/PIDF on output 1 and 3 will disable outputs 2 and 4.

Availability: TANDBERG T1, TANDBERG C90, TANDBERG C90 Integrator  
 Restrictions: None

**Network**

**H.323**

**Alternate Gatekeeper**

The C90 supports alternate gatekeeper and when it registers to a gatekeeper that supports alternate gatekeepers, the endpoint will receive a primary and a list of secondary gatekeeper addresses. If the primary gatekeeper fails, the C90 will register to one of the secondary gatekeepers that was declared by the primary gatekeeper.

Availability: TANDBERG T1, TANDBERG C90, TANDBERG C90 Integrator  
 Restrictions: None

**H.235 Gatekeeper Authentication**

The C90 supports authentication via a user name and password. This feature requires a time source supplied by a Network Time Protocol (NTP) as part of the authentication process. H.235 authentication requires a H.235 compliant gatekeeper or border controller to validate the endpoint. If an endpoint tries to register without authentication or with invalid authentication credentials, the endpoint registration will be rejected.

Availability: TANDBERG T1, TANDBERG C90, TANDBERG C90 Integrator  
 Restrictions: None

**H.460.18/.19 and Assent Firewall Traversal Support**

The C90 supports the firewall traversal using H.460.18 and H.460.19 standards-based firewall traversal, giving multi-vendor environments the ability to take full advantage of the secure firewall traversal methodology that has been proven successful by TANDBERG customer deployments. The previous, proprietary version of TANDBERG Expressway firewall (Assent) traversal technology is also supported in the C90 for backwards compatibility.

Availability: TANDBERG T1, TANDBERG C90, TANDBERG C90 Integrator  
 Restrictions: None

***Downspeeding***

If the C90 encounters excessive packet loss, above 10% for 2 seconds, the C90 will automatically downspeed the far end using flow control in steps of 64kbps until acceptable packet loss is detected.

Availability:           TANDBERG T1, TANDBERG C90, TANDBERG C90 Integrator

Restrictions:         None

**SIP**

Current RFC's and drafts supported in TC1.0.0.

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 2429 RTP Payload Format for the 1998 Version of ITU-T Rec. H.263 Video (H.263+)  
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 4583 SDP Format for BFCP Streams  
draft-ietf-sipping-cc-transfer-06.txt  
draft-ietf-avt-rtp-h264-rcdo-01.txt  
draft-ietf-avt-rtp-h264-params-01.txt

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

Availability: TANDBERG T1, TANDBERG C90, TANDBERG C90 Integrator

Restrictions: Hold / Resume / Transfer / Forward are not support in software TC1.0.0

### **SIP Encryption**

To ensure the security of SIP calls, TC1.0.0 includes support of encryption for all SIP call control and media. The transport/call control channel will be encrypted using TLS with a key that is negotiated using the Diffie-Hellman method. All media is then encrypted with AES (Advanced Encryptions Standard) 128bit using SRTP.

Availability: TANDBERG T1, TANDBERG C90, TANDBERG C90 Integrator  
Restrictions: Requires TLS support within the SIP proxy  
Verified TLS is currently not supported in software TC1.0.0

### **MultiSite<sup>TF</sup>**

#### **4-Way MultiSite<sup>TF</sup>**

The C90 supports a 4-way internal MultiSite (including Host) feature which allows the end-users to add more the just one participant over IP network to a total maximum bandwidth of 10Mbps. Presentation can also be shared during the MultiSite call from any one in the call with H.239 dual streams. To ensure the MultiSite is secure, all calls can be encrypted with AES 128bit encryption.

Availability: TANDBERG T1, TANDBERG C90, TANDBERG C90 Integrator  
Restrictions: MultiSite Option required.  
Telephone participants not supported in TC1.0.0 software.  
Conference control not supported in TC1.0.0 software.

#### **High Definition MultiSite<sup>TF</sup>**

The C90 supported the high definition MultiSite feature of 1280 x 720 (720p@30fps) and also supporting 1920 x 1080p (1080p@30fps) with AES encryption and H.239 dual streams from any sites in the conference.

Availability: TANDBERG T1, TANDBERG C90, TANDBERG C90 Integrator  
Restrictions: MultiSite Option required.  
Premium Resolution Option required for 1080p support

#### **MultiSite<sup>TF</sup> Individual Transcoding**

The C90 supports individual audio and video transcoding for all sites that are connected to the internal embedded MCU, providing the best possible video and audio quality to each participant connected to the C90 MultiSite conference.

Availability: TANDBERG T1, TANDBERG C90, TANDBERG C90 Integrator  
Restrictions: MultiSite Option required



## Security

The C90 supports the following security features: HTTPS, SSH, IP Administrator Password, Disabling of IP servers, and Serial Port Login.

Availability: TANDBERG T1, TANDBERG C90, TANDBERG C90 Integrator

Restrictions: IP Administrator password configured from API

## User Interface

The C90 user interface is designed to provide minimal, yet informative feedback to the end user in terms of icons and menus on the screen during calls. The menus will move in and out from the bottom left corner. The icons will move in and out from the right side. The icons will either appear for a few seconds during a connection, or display during the conference to inform the user of the current status of the local endpoints. For example, Microphone Mute, Volume levels and if the far-end Microphone is muted or the call is not encrypted.

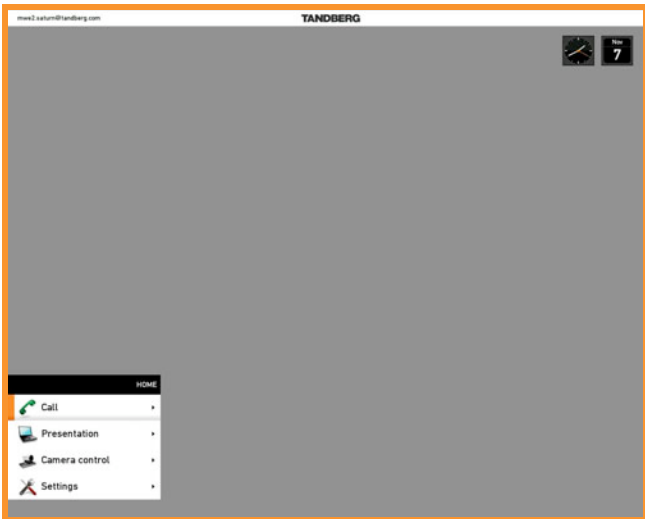


Figure 16: C90 User Interface

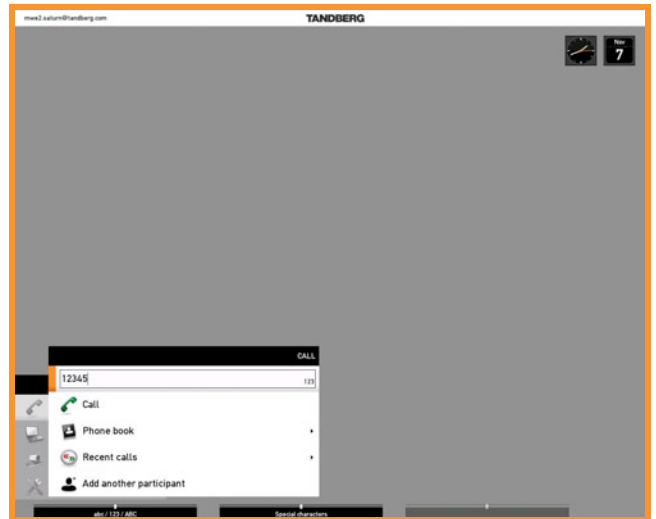


Figure 17: C90 User Interface \ Placing a Call

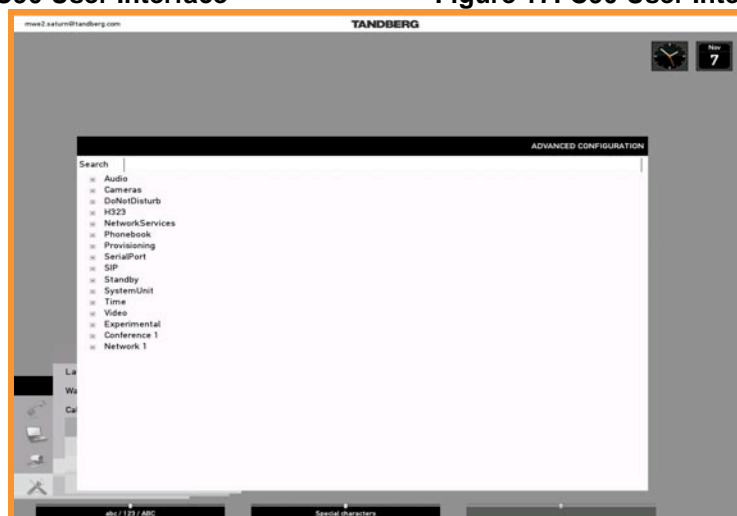
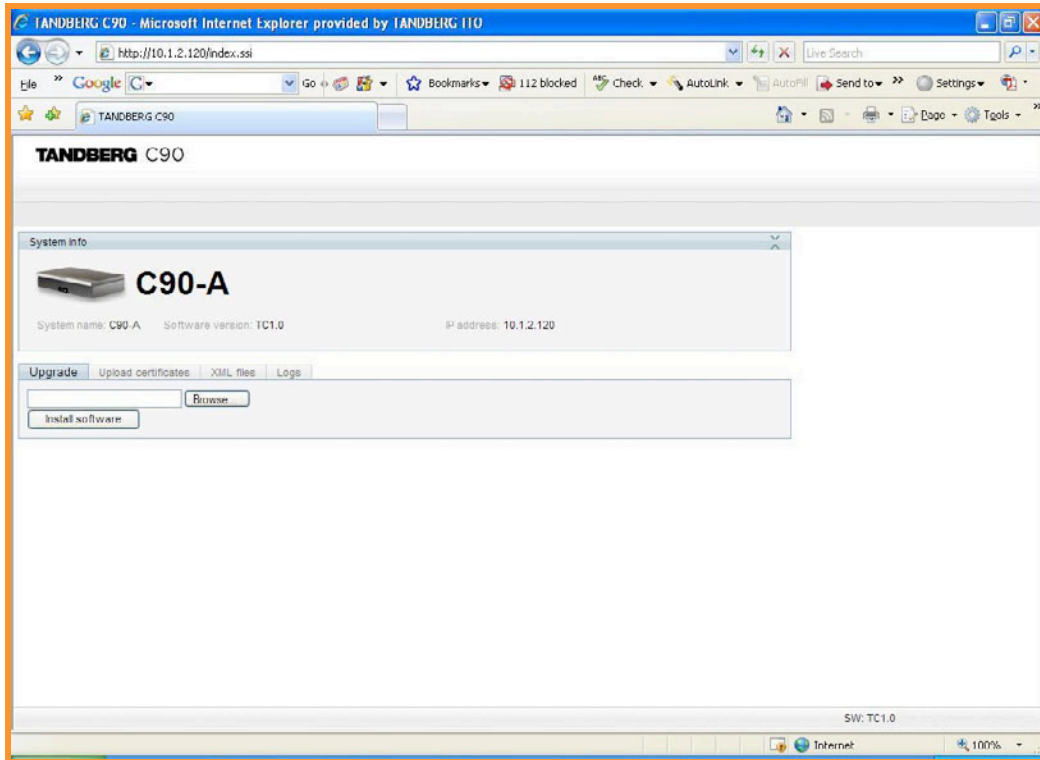


Figure 18: C90 Advanced Configuration

Availability: TANDBERG T1, TANDBERG C90, TANDBERG C90 Integrator  
 Restrictions: None.

**Web Interface**

The C90 web Interface will currently allow software upgrades, upload certificates for HTTPS, and to view XML files and system logs.



**Figure 19: C90 Web Interface**

Availability: TANDBERG T1, TANDBERG C90, TANDBERG C90 Integrator  
 Restrictions: Configuration and control not currently support from the Web Interface

**Short Cuts**

**System Information and Call Status**

To quickly display the system information and call status menus, press the “Home” button and then the fifth (5<sup>th</sup>) function key on the top of the remote control. This will display the home menu and then the System information menu.

**User Interface Output Selection**

Due to the number of different outputs that the C90 supports, it is possible that the menu will not be displayed on the proper monitor. For ease of implementation, it is possible to enter a key sequence on the C90 to enable the on screen display on the appropriate output. The key sequence that needs to be followed is below.

Disconnect \* # \* # 0 x # (where x is output 2, 3 or 4)

### Other Input / Outputs

- 1 x GPIO indicated in red ■ (General Purpose Input / Output) 6 pin phoenix connector. Reserved for future use.
- 2 x USB indicated in blue ■ Host and Device. Reserved for future use.
- 2 x Gigabit Ethernet interfaces indicated in yellow ■, First Ethernet interface used and second reserved for future use.
- 2 x T Link Interfaces indicated in orange ■ Input and output. Reserved for future use.
- 2 x Female Serial Interfaces indicated in green ■, Com 1 for External Control and second for Camera which supplies control and power.
- 1 x Ground Terminal Screw indicated in bright green ■.



Figure 20: C90 Backplane \ Other Inputs & Outputs

### API / XML

For more details, please reference to the TANDBERG C90 System Integrator Guide, document D14128 Rev.02

## Supplemental Notes

### Software Filenames

The correct software filename is listed in the following table.

<b>TANDBERG C90 System</b>	<b>Software</b>	<b>Serial Number Range</b>
AES Encryption	s52000tc10.pkg	All

### References

TANDBERG Website <http://www.tandberg.com>  
TANDBERG FTP Site <http://ftp.tandberg.com>

For all documentation, please see the TANDBERG Support Website at <http://www.tandberg.com/support/documentation.php>

## Known Limitations

The focus for the first release of the C90 is for use as the Telepresence engine for the TANDBERG Telepresence T3 system. TANDBERG has discovered some interoperability issues recently with other vendor's video systems and is working with these vendors to address these issues. A software release is planned for Q1 2009 to address these issues.

### TANDBERG

<i>Ref. ID</i>	<i>Equipment</i>	<i>Limitations</i>
57414	TANDBERG C90	Currently the Alarm LED in front of the codec is not in use.
N/A	TANDBERG C90 Ver. TC1.0.0 (User Interface)	The "Menu Password" feature does not properly restrict access to the administrative menu of the C90.
N/A	TANDBERG C90 Ver. TC1.0.0 (H.239)	The UXGA (1600 x 1200) resolution is currently not supported over H.239.
58915	TANDBERG C90 Ver. TC1.0.0 (SIP Dual Stream)	Currently SIP dual stream does not work as expected between C90 endpoints.
N/A	TANDBERG C90 Ver. TC1.0.0 (Audio Calls)	Audio only (VoIP) calls are currently not supported.
N/A	TANDBERG C90 Ver. TC1.0.0	The VGA (640 x 480) resolution is currently not supported.
58884	TANDBERG C90 Ver. TC1.0.0 (HDMI Outputs)	Currently if no monitor is connected to the HDMI outputs of the C90, then no video will be displayed. Recommend connecting all cables then power on the system.
N/A	TANDBERG C90 Ver. TC1.0.0 (TMS Ver.12)	Currently TANDBERG Management Suite (TMS) Ver. 12 does not support the C90 endpoint. If required, a patch is available for supporting the C90. Please contact your TANDBERG Sales Engineer regarding this TMS patch.
N/A	TANDBERG PrecisionHD 1080p Camera Ver. ID:40020 (HD-SDI Output)	Currently the HD-SDI output on the PrecisionHD 1080p camera will support up to 1280 x 720 at 60 fps (720p@60).
57452	TANDBERG C90 Ver. TC1.0.0 (Over Scan \ Video)	It is possible for some monitors to over-scan the output of the C90 endpoint, thus displaying the administrative menus off screen. To resolve this issue, it is recommended to change the video output resolution of the C90 to a more compatible monitor resolution.
56889	TANDBERG C90 Ver. TC1.0.0 (Recent Call List)	It is possible that entries selected from the 'Recent Calls' list will not connect upon call initiation. To resolve, it is recommended that the far end is manually dialed at this time.
58554	TANDBERG C90 Ver TC1.0.0 (TANDBERG MCU Ver. D3.10 & MPS Ver. J4.3 \ 720p HD Video)	Currently there is distorted video displayed on the C90 during a TANDBERG MCU and TANDBERG MPS conference at 720pHD video.

58555	TANDBERG C90 Ver. TC1.0.0 (TANDBERG GW Ver. G3.2 & MPS GW Ver. J4.3 \ Video)	Currently there is distorted video displayed on the C90 during a TANDBERG GW and TANDBERG MPS GW call.
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**Polycom**

<i>Ref. ID</i>	<i>Equipment</i>	<i>Limitations</i>
55407	TANDBERG C90 Ver. TC1.0.0 (Polycom HDX Ver. 2.0.3.1-2729 & VSX Ver. 9.0.1 \ H.239)	Currently H.239 does not work as expected with the Polycom VSX and HDX endpoint lines.
54473	TANDBERG C90 Ver. TC1.0.0 (Polycom MGC Ver. 9.0.1.8 \ Secondary Connections with H.264)	When connecting to the Polycom MGC, the C90 will only connect as secondary (Audio Only) when H.264 is the selected video protocol. To resolve, change the video protocol H.263 or H.261 setting in the MGC.
58556	TANDBERG C90 Ver. TC1.0.0 (Polycom MGC Ver. 9.0.1.8 \ H.239)	Currently H.239 does not work as expected with the Polycom MGC.
54607	TANDBERG C90 Ver. TC1.0.0 (Polycom RMX2000 Ver. 3.0.0.94 \ Calling In)	The TANDBERG C90 is unable to call into a Polycom RMX2000 conference.
58557	TANDBERG C90 Ver. TC1.0.0 (Polycom RMX2000 Ver. 3.0.0.94 \ Connection)	Currently only 1 C90 will connect to a Polycom RMX2000 (RMX Calling out) conference at a high call rate of 1472k, or 2Meg with or with out HD 720p active.
54804	TANDBERG C90 Ver. TC1.0.0 (Polycom RMX2000 Ver. 3.0.0.94 \ H.239)	H.239 does not interoperate with the Polycom RMX2000 bridge.

**LifeSize**

<i>Ref. ID</i>	<i>Equipment</i>	<i>Limitations</i>
55167	TANDBERG C90 Ver. TC1.0.0 (LifeSize Room Ver. 3.5.3(11) \ Video)	When connecting to a LifeSize Room system, frozen video will be displayed over both an H.323 and SIP connection. Both TANDBERG and LifeSize are working together for a quick solution to this issue.

## Interoperability Testing

The following systems have been tested and verified compatible with this software release.

### H.323 Gatekeepers/Traversal Servers

<i>Equipment</i>	<i>Software Revision</i>	<i>Comments</i>
TANDBERG Gatekeeper	N6.1	
TANDBERG Border Controller	Q6.1	Both Assent and H.460.18/.19 traversal technologies are supported
TANDBERG Video Communication Server (VCS)	X3.0, X3.1	Both Assent and H.460.18/.19 traversal technologies are supported

### SIP Registrars/Proxies

<i>Equipment</i>	<i>Software Revision</i>	<i>Comments</i>
TANDBERG Video Communication Server (VCS)	X3.0, X3.1	

### Gateway Interoperability

<i>Equipment</i>	<i>Software Revision</i>	<i>Comments</i>
TANDBERG MPS Gateway	J4.3	See Known Limitations Sections Ref. # 58555.
TANDBERG Gateway	G3.2	See Known Limitations Sections Ref. # 58555.

### MCU Interoperability

<i>Equipment</i>	<i>Software Revision</i>	<i>Comments</i>
TANDBERG MPS	J4.3	See Known Limitations Sections Ref. # 58554.
TANDBERG MCU	D3.10	See Known Limitations Sections Ref. # 58554.
TANDBERG\Codian 4210	2.4(1.10)	
TANDBERG\Codian 4505	2.4(1.10)	

### Streaming Servers

<i>Equipment</i>	<i>Software Revision</i>	<i>Comments</i>
TANDBERG Content Server	S3.1	

## Endpoint Interoperability

<i>Equipment</i>	<i>Software Revision</i>	<i>Comments</i>
TANDBERG MXP	F7.2	H.323 and SIP
TANDBERG Personal Series	L5.1	H.323 and SIP
TANDBERG Classic	E5.3/B10.3	H.320 and H.323