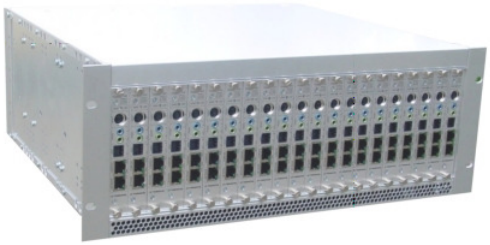
DEC-200™ H.264 AND MPEG-2 DECODER

DEC-200 in a FR-110 Chassis
Stand-Alone MPEG-2/H.264 Decoder Package



FR-2000 Chassis
High-Density Rack Package
Up to 21 independent streaming blades in a 4RU frame

User Guide V2.7

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If you find some points in this document unclear then please let us know, so we can improve this documentation.
Thank you! Mail to: documentation@teracue.com

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I. Information about the manual

This document is designed to help users setup, configure and work with the H.264/ MPEG-2 decoders.

If you received this publication as a PDF, then it's a good idea to print it out for future reference.

It is best to use this user guide directly in front of your computer, by doing so you try out everything at once.

.!. Important features are marked by this sign.

II. Release Notes

Following are the Features listed which are supported from the firmware versions:

Version 0.1.8 – 09/26/2008 16:00
- Analogue Audio R + L Output are supported.
- Support of PAL
- CVBS Video Output is supported by using the breakout cable.
- YC Video Output is supported.
- SDI Video Output is supported by using the BNC interface on the front panel.
- Receiving and processing of MPEG-2 SD streams is possible.
- Receiving and processing of H.264 SD (MPEG-4 part 10) streams is possible.
- Simple firmware updating via web interface.
- Network settings are adjustable.
- Overview of the DEC's system environments displayed under 'System' menu, i.e. decoder CPU load, firmware version.

Version 0.1.9 – 0.1.12 – Internal Versions

Version 0.1.13 – 10/17/2008 17:36
- Supports the automatically and manual setting of the Video PID and of the Program number.

Version 0.1.14 – 0.1.16 – Internal Versions

Version 0.1.17 – 10/30/2008 06:24
- Supports changing the hostname of the DEC-200™
- Improvement of the unicast reception

Version 0.1.18 – 12/05/2008 16:48
- Support of the Factory-Reset feature via jumper
- Video streams can be also decoded and displayed, which do not contain any IDR-Frames

Version 0.1.19 – 0.1.21 – Internal Versions

Version 0.1.22 – 03/06/2009 12:47
- Support of NTSC
- Support of RGB and Component as Video output
- Support of Talkback with the ENC-100™ v3.12

Version 0.1.23 – 0.1.26 – Internal Versions

Version 0.1.27 – 07/30/2009 13:12
- Genlock
- DHCP Support
- OSD-Display at the program start for 2-3 seconds
- Video Loss Display is added. Upon video loss users can choose between 'Blank', 'Hold' and 'Colour bar' to display a frame in spite of a video loss.
- Real Time Clock (RTC) support

Version 0.1.28 – 1.29.7 – Internal Versions

Version 1.29.8 – 11/02/2009 09:21
- Page refresh of the DEC web pages are supported
- XPlayer-Link added. To check, whether the entered source input stream is available in the network. If the Standalone XPlayer is installed on the client PC, running the web-config pages, the XPlayer can directly be launched by a mouse click from the user interface.
- Aspect ratio letter-boxing added for MPEG-2 PAL and NTSC
- Talkback performs now auto-reconnect
- Improvement of multicast socket handling
- Enhanced long term stability

Version 1.29.9 – Internal Version

Version 1.29.10 – 11/19/2009 09:39
- CVBS / SDI Output Switching of the BNC Connector on the Front Panel

Version 1.29.11 – 1.29.13 – Internal Versions

Version 1.29.14 – 01/28/2010 17:29
- Comport for RS-232 operation is supported and settings are adjustable via GUI.
- DF-Mode is added. This mode is for a better audio/video delay when the audio/video delay of the source is bad.

Version 1.29.15 – 1.31 – Internal Versions

Version 1.32 – 03/26/2010 12:53
- PTS based AV sync implemented for that case that audio comes first.
- Improved decoder/transport settings menu.
- Display aspect ratio 4:3/16:9. With MPEG2 aspect ratio is set to the value found in VES, with H.264 no aspect ratio conversion is done.
- Video format mismatch correction (only spatial):
  NTSC: PAL 'overhead' is cut off symmetrically
  PAL: NTSC is displayed centred (letter-boxed).
- Display state messages 'STREAM LOSS' when 'StreamLoss Display' is set to 'B/W TEXT'.
- Display state messages 'NETWORK LOSS' when the decoder loses the network connection.
- Play sine wave when 'StreamLoss Display' is set to 'COLORBAR'.
- GPIO function is added; GPIO Modes: Manual, Passthrough/A, Passthrough/B.
- Added support for Status LED.
- Movies with an unknown resolution will be centred now.
- New Comport Mode 'Packet' is added for a tunnelled data transmission with the compliance of the temporal sequence.
- New setting options in the decoder/audio settings menu: 'Talkback Port' and 'Output Mute'.
- Audio gain values are now set in dB values instead of percent values.
- Change video output (CVBS, RGB ...) works now also without the reboot.
- Selectable network link mode.
- New system status parameter added: 'Mac Address' and 'Link Mode'.

Version 1.33 – Internal Version

Version 1.34 – 06/15/2010 13:48
- Embedded audio flag was corrected.

Version 1.35 – 1.37 – Internal Versions

Version 1.38 – 08/10/2010 20:36
- Audio PID is user configurable.
- UDP receive-buffers were increased.
- Improved audio/video synchronisation.
- WSS signalling added.
- Full SNMP remote control added and MIB files. All settings can be remotely configured by 3rd party SNMP manager.
- SNMP status traps added

Version 1.39 – 1.41 – Internal Versions

Version 1.42 – 03/18/2011 14:41
- Support for TCP transmissions in connection with the ENC-200™
- support for traceroute
- Implemented a more intelligent adaptive DF mode which includes now also an low delay mode

Version 1.43 – 1.46 – Internal Versions

Version 1.47 – 12/20/2011 12:27
- 'DF mode' is renamed in 'Low Latency'
- No 'Streamloss' display when audio only streams are received
- Comport: New Packet Mode with TCP
- Comport: Passthrough-Mode optimized for transfer of short packages
- Talkback: Added support for down sampling
- Restart audio streaming in case of stream errors
- ENC-200™ codec's (H.264 and AAC) are now default for decoding. Previous default codec's were MPEG2 and MPEG audio.
- Added more AAC format checks, changed AAC frame syncing to get a more robust decoding process.
- New config option 'Enable Config Port' added, to enable or disable configuration port 2323.

Version 1.48 – 02/15/2012 11:14
- Bigger retry-interval to create a new connection via TCP

Version 1.49 Internal Version

Version 1.50 – 07/27/2012 13:26
- BUGFIX: No audio with french ARTE SD.
- fix broken audio channel status data (ICUE... usw) for SDI
- swap left and right for digital audio and align samples
- align samples for analog audio

Version 1.51 – 01/15/2013 10:33
- BUGFIX: Re-enable factory reset via jumper

Version 1.52 – 05/16/2013 18:23
- "Stop Interval" for TCP (re)connection
- BUGFIX: enable DHCP

III. Content

1. Overview

The DEC-200™ is a compact, low cost H.264 SD and MPEG-2 SD video/audio stream receiver and decoding appliance. Furthermore, the DEC-200™ real-time decoders are robust 24/7 LIVE stream decoders for all types of operating conditions. The decoder supports RGB, Component (YP_bP_r), S-Video, Composite and SDI (with embedded audio).

It is designed for LAN and intranet network video applications. As an output point for streaming media, it provides easy access to professional DVB/DVD-quality streams.

Decode streams with the DEC-200™ to provide networking video and audio on standard TV's, LCD's, plasmas, monitors and on projectors. The DEC-200™ provides versatile video/audio output in one simple and low-cost solution. Video-over-IP reception and DVB/DVD-quality processing of both H.264 and MPEG-2 SD streams are supported by the compact, flexible, yet robust and highly supportable DEC-200™ 'blade-based' appliance.

Use the DEC-200™ for LIVE video networking applications. Place the DEC-200™ anywhere on the network to facilitate DVD-quality video viewing of camera signals, TV channels, monitoring feeds or any other standard H.264 SD and MPEG-2 SD streaming video and audio source on the network.

When combined with the ENC encoder series or the DVB/IP video gateways, the DEC-200™ becomes part of a comprehensive real-time LIVE video transmission, collaboration, contribution, trunking, monitoring or publishing system.

Configure and control through any standard web browser, no special tools required. Access the administrative interface and decoder configuration directly from your PC web browser to configure and start using the DEC-200™. You have full control via an intuitive graphical user interface.

All DEC-200™ decoders process input streams in full DVB/ DVD-quality for professional output on any kind of display device.

DEC-200™ combines high-performance with unparalleled simplicity in a compact Ethernet video decoding appliance designed for commercial, institutional, and industrial applications such as:

- Broadcast/TV Distribution over IP
- IPTV/Confidence Monitoring
- Security/Surveillance/Monitoring/Public Safety
- Medical/Corporate/Military/Industrial Training
- Education/Distance Learning/Tele-Teaching
- Finance/Brokerage Television
- Legal/Legislative Communications
- Manufacturing/Process Monitoring
- Hospitals/Clinics/Telemedicine
- News/Sports/Advertising Agencies – Air/Rail station advertising

The DEC-200™ runs on an embedded Linux platform. This decoder is designed without any moving parts, as hard drives/fans, to ensure system uptime, reliability and noiseless operation. The DEC-200™ can be used in extreme operating conditions and at temperatures up to max. 60°C.

The DEC-200™ blades are operated inside the FR chassis series. Blades can be used in the FR-110 single channel chassis or in the FR-210 dual channel chassis. High-density requirements are solved by operating the DEC blades in the FR-2000 multi-channel rack, which can hold up to max. 21 Teracue blades. Different blade products like the DEC-200™ blades, the ENC encoder blades and DVB/IP video gateways can be 'mixed and matched' in the FR-2000 frame.

2. General Information

You can operate the DEC-200™ blades in the FR-110 single blade chassis, in the FR-210 dual blade chassis or in the FR-2000 multi-channel rack chassis. For example when only a small amount of decoders is required, or if single channel decoders need to be set up at dispersed network locations.

All equipment (like the chassis) and DEC-200™ accessories are handled as model options and need to be purchased separately.

2.1 Unpacking the Decoder

When you unpack the ordered equipment, please make sure that all the equipment is complete.

Normally the DEC-200™ blades are pre-fit into the according chassis that the decoders have been ordered with.

If DEC-200™ blades are ordered and shipped separately, please be careful when handling the blades. Be sure to avoid electrostatic influence when touching the blades.

After unpacking, your DEC-200™ should include the following:

- 1 x Teracue DVD which includes this user guide
- 1 x DEC-200™ H.264/MPEG-2 Decoder blade
- 1 x Breakout cable 'S'

2.2 Setting up the Decoder and Safety Instructions

Always read the instructions carefully and keep this user guide for future reference.

Please choose a suitable location for operating the decoder(s).

The DEC-200™ should not be exposed to the following:

- Moist and dusty environments.
- Air humidity above 80%.
- Avoid extreme vibrations or shocks.
- Direct sunlight and extreme heat.
- Temperatures below 0°C and above +65°C.
- Avoid quick and dramatic temperature changes.

.!. Please set up the decoder on a reliable and flat surface when using the FR-110/FR-210 chassis or mount in a rack, when using the FR-2000 chassis.

2.3 Connecting the Decoder (FR-110 chassis)

Please pay attention about the cabling order between the power supply and the FR-chassis. Connect at first always the connector of the power supply to the FR-chassis.

The cable connector can be locked to the socket of the decoder, so the cable cannot accidentally be pulled out [Bayonet Socket]. To do so the connector has to be placed on the socket and lightly turned 90° in a clockwise motion.

After you have connected the connector of the power supply to the chassis, please connect the power cable to the power supply.

As next, please connect the network cable to the network interface and connect your display unit to the video output of the DEC-200™. Concerning of the video output you have the choice between different video signal types. The DEC-200™ supports SDI (with embedded audio), Composite, S-Video, YP_bP_r, RGB signals. If you need a Composite (CVBS), S-Video (YC), YP_bP_r or a RGB signal, please use the Sub-D 26-pin connector via the breakout cable. If you need a SDI or Composite signal, please use the BNC connector.

If you want use analogue audio, please use the Sub-D 26-pin connector via breakout cable.

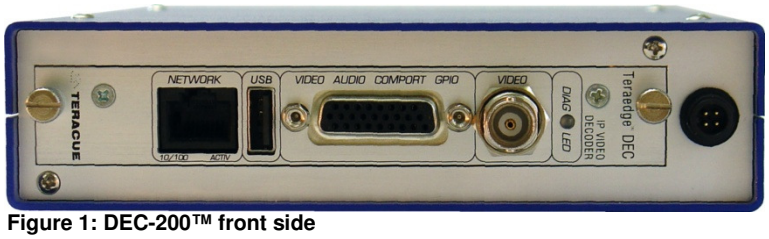


Figure 1: DEC-200™ front side

Front panel connection:	Description:
Network:	Standard 10/100Mbit/s Ethernet via RJ-45
USB:	USB-interface.
Video Audio Comport GPIO:	Audio-, Video- and Data Output/Input for Composite, S-Video, YP_bP_r, RGB, Audio-In, Audio-Out, GPIO, AES-Out, RS-232, Genlock-In, Composite-Sync-Out via Sub-D 26 pin interface.
Video:	Video Output for Composite or SDI (with embedded Audio) via BNC interface.
LED:	LED status indicator. The LED indicates the status (operational state) of the DEC-200 decoder. The status is indicated by the LED colour and LED flashing (blinking) speed.
Power supply connector:	Cable connector for the power supply.

LED status:	Description:
Constant green:	OK, decoder in operation, decoding video.
Flashing green:	OK, but stream input is missing.
Flashing red:	Network error. Decoder receives no data packets.
Constant red:	General error.
No LED light:	Check power and power supply.

Table 1: Description of the connectors on the DEC-200™ front side

CVBS = FBAS = Composite Signal
YC = S-Video Signal

2.4 Assignment of the Sub-D 26-pin Connector

Table 2 describes the Assignment of the Sub-D 26-pin connector which is on the front side of the DEC-200™.

Pin:	Sub-D 26-pin Connector Assignment:
1	AES 1 Out
2	TxD
3	GPO
4	Audio In R
5	Audio Out R
6	Composite Sync Out
7	Video Out / Y / G
8	Video Out CVBS / P_b / B
9	Video Out C / P_r / R
10	GND
11	GND
12	GND
13	GND
14	GND
15	GND
16	GND
17	GND
18	GND
19	AES 2* Out
20	RxD
21	GPI
22	Audio In L
23	Audio Out L
24	3.3V (See also chapter 9, page 62)
25	GND
26	Gen Lock In

Table 2: Assignment of the Sub-D 26-pin Connector

CVBS = FBAS = Composite Signal
YC = S-Video Signal
* = is not supported at the moment

2.5 Breakout Cable ‘S’

For the DEC-200™ it exists two different breakout cables which are called **Breakout cable ‘S’** and **Breakout cable ‘P’**. The Breakout cable ‘**S**’ is the **s**tandard breakout cable and Table 3 describes the provided signals.

Signal:	Connector Type:
Audio In R + L	Mini Jack 3,5 mm
Audio Out R + L	2 x Cinch (RCA)
Video CVBS	Cinch (RCA)
Video YC	Mini-DIN 4-pin (Hosiden)

Table 3: Breakout cable 'S'

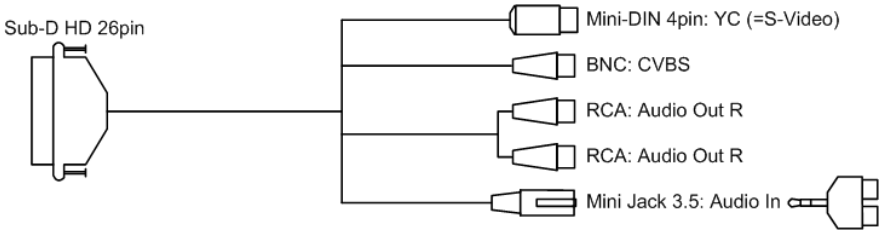


Figure 2: Breakout cable 'S'

CVBS = FBAS = Composite Signal
YC = S-Video Signal

2.6 Breakout Cable ‘P’

For the DEC-200™ it exists two different breakout cables which are called **Breakout cable ‘S’** and **Breakout cable ‘P’**. The Breakout cable ‘**P**’ is the **p**rofessional breakout cable and Table 4 describes the provided signals.

Signal:	Connector Type:
AES 1	BNC
AES 2*	BNC
RS-232	Sub-D 9-pin
GPIO	Sub-D 9-pin
Audio In R + L	2 x Cinch (RCA)
Audio Out R + L	2 x Cinch (RCA)
Composite Sync Out	BNC
Video CVBS / YC / YP_bP_r / RGB	3 x BNC
Gen-Lock In	BNC

Table 4: Breakout cable 'P'

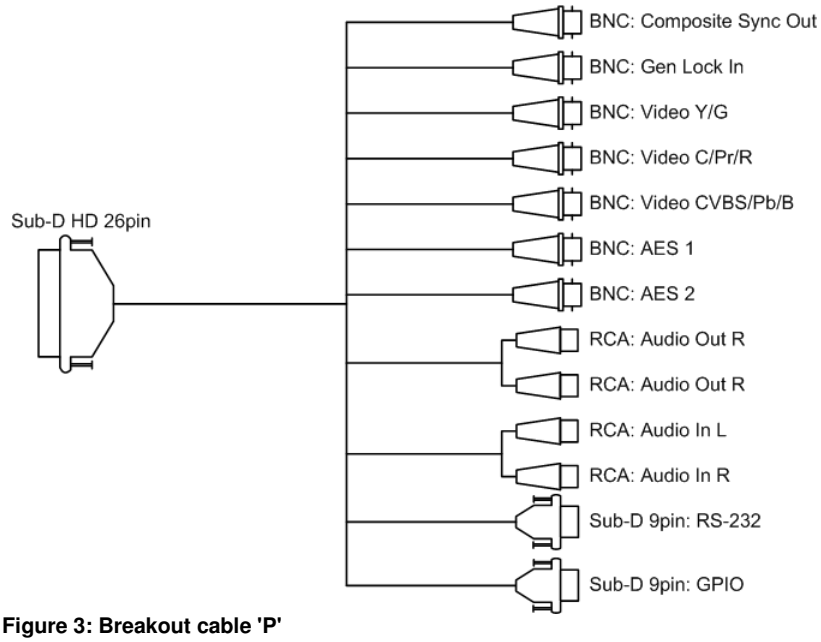


Figure 3: Breakout cable 'P'

CVBS = FBAS = Composite Signal
YC = S-Video Signal
* = is not supported at the moment

3. DEC-200™ User Guide

This chapter gives you an overview over DEC-200™ and demonstrates the decoder's main functions.

.!. Before proceeding please be sure that the decoder is setup correctly and all necessary connections are established.

Working and configuring Teracue's decoders is very easy.
You do not need to install an application or remote configuring software. If you know how to browse the internet, then you already know how to access and control the decoders, simply via web-browser.

3.1 Accessing and Configuring Decoders

Open your standard web-browser and type in the decoder's IP-address (e.g. '172.16.20.200') in the address field and press the 'Enter' button.

.!. If you haven't changed the factory presets and if not specified elsewhere in the shipment the decoder's IP-address will by default be set to: 172.16.20.200.

Default IP-address:	**172.16.20.200**
Login username:	**admin**
Login password:	**admin**

.!. The decoder is configured by factory default to automatically start the decoding process and displaying the stream of the multicast address 239.252.20.100, when a network link and a link to the display unit are established.

.!. To be able to login to the decoder's user interface, your computer has to be in the same IP-address range (subnet).

You briefly might have to change your computers IP-address to be in the same subnet as the decoder. Only then you will be able to access the decoder and change the decoder's IP-address, and of course afterwards change your computer's IP-address back.

3.2 Login

After typing the IP-address of your DEC-200™ into the browser and hitting enter, a login screen should appear. See Figure 4.

Enter your username and password and click on ‘login’.

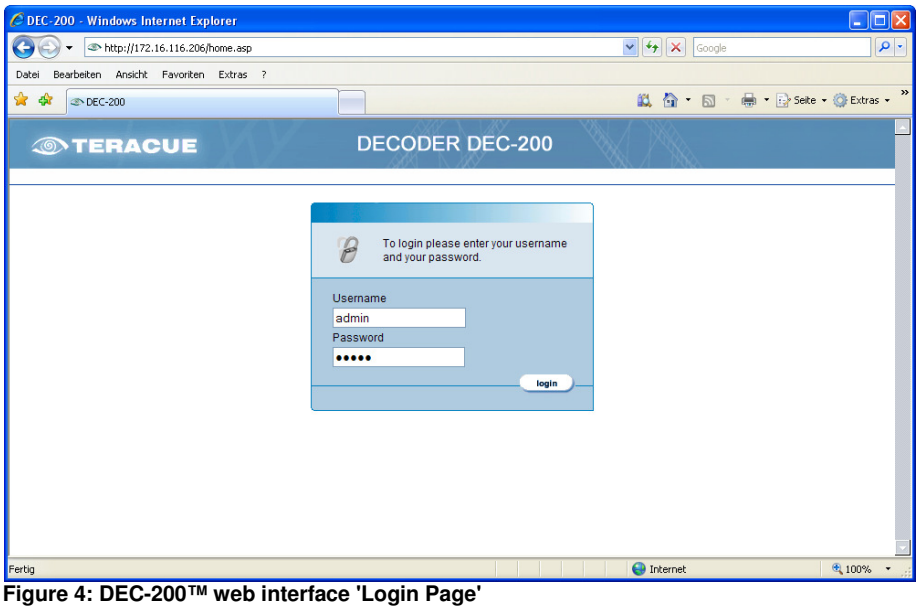


Figure 4: DEC-200™ web interface 'Login Page'

Default IP-address:	**172.16.20.200**
Login username:	**admin**
Login password:	**admin**

3.3 Graphical User Interface of the DEC-200™

3.3.1 Navigational Menus

After successful login you have access to the decoder's configuration. All of the settings can be adjusted via web-browser.

Main Menu:
The main menu contains the 'DECODER', 'NETWORK', 'COMPORT', 'SYSTEM', 'HELP' and 'LOGOUT' links from the top bar. See Figure 5.

Secondary Menu:
After selecting the desired menu item from the main menu, choose an area for configuration from the secondary menu, which is resides on the left-hand side. See Figure 5.

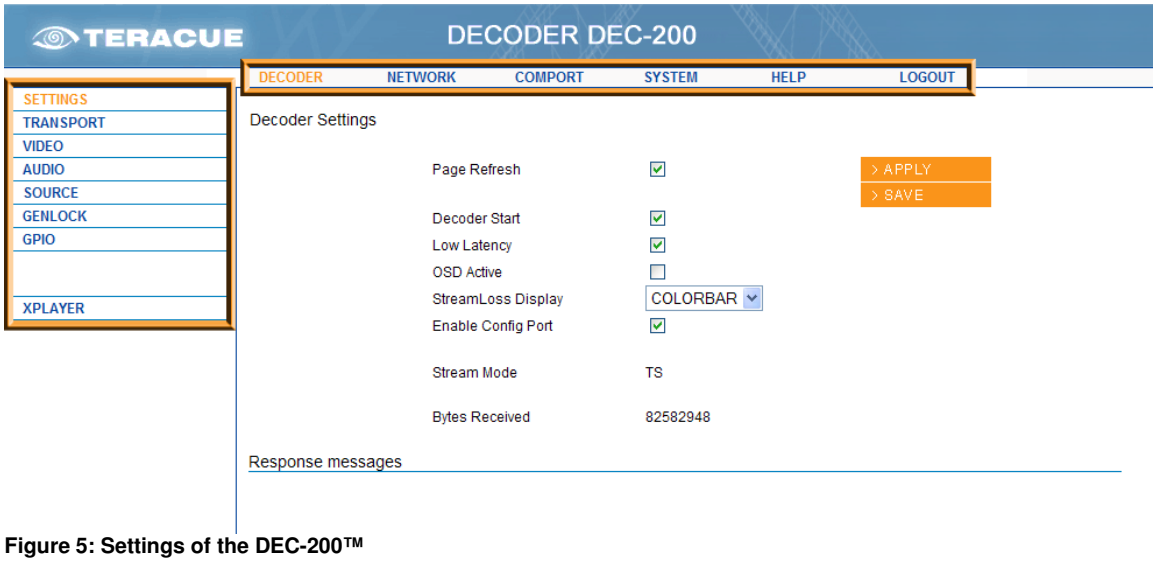


Figure 5: Settings of the DEC-200™

3.3.2 ‘APPLY’ and ‘SAVE’ Buttons

A change or multiple changes of the configuration settings will only take effect after the ‘> APPLY’ button is pressed.
The decoder will then start working with the new parameters, but the parameters will not be saved to the decoder. Applied settings are not saved and will be lost after a reboot.
Good for quickly testing and applying different settings.

Same as the ‘> APPLY’ button, **but** the configuration parameters will be applied and saved to the decoders flash memory.
Saved parameters will be used by the decoder even when the decoder is turned off & on or after a reboot has taken place.
Good for permanently saving the decoder configuration.

3.4 Decoder Configuration

3.4.1 Menu: Decoder / Settings

Under the menu option 'DECODER/SETTINGS' you define the main operational state of the decoder. Here you can set decoding process to 'On' or 'Off' and enable the Overlay Status Display (OSD). See Figure 6.

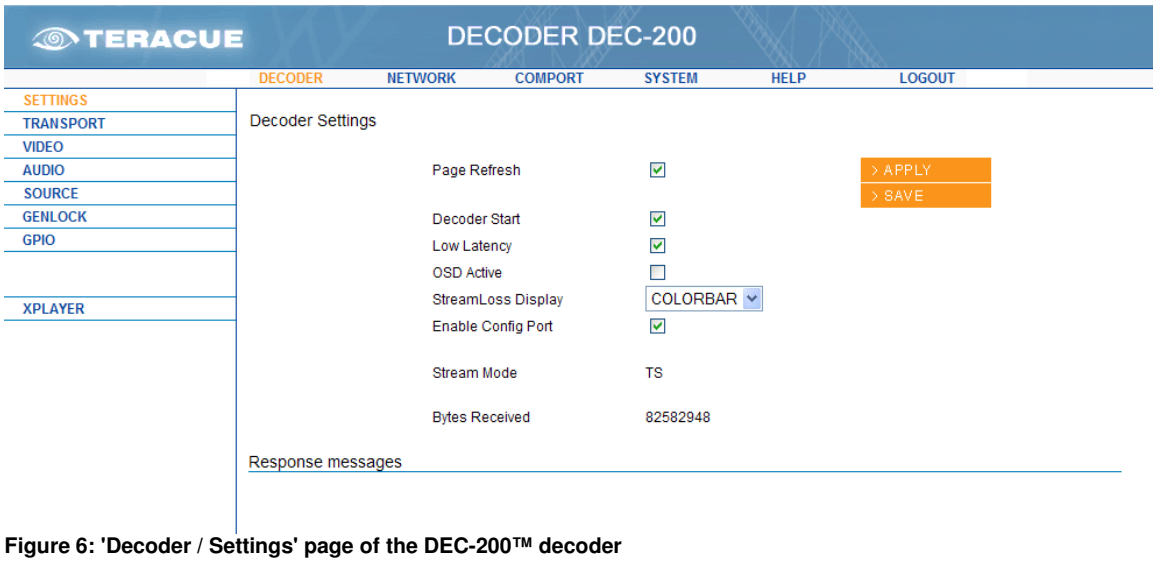


Figure 6: 'Decoder / Settings' page of the DEC-200™ decoder

Settings:	Description:
Page Refresh:	If the Check-box is checked, the web-side will be refreshed every 10 seconds.
Decoder Start:	Stops or starts the decoding process.
Low Latency:	Enables / Disables the low delay mode and improves the audio video offset, if the source of the encoder has not a compliant audio video offset. **.!. The 'Low Latency' should be always enabled, if it is well-known that the used encoder has also a 'Low Delay' Mode (e.g. the ENC-200™) and the user wants the lowest delay.**
OSD Active:	Enables / Disables the Overlay Status Display (OSD).
StreamLoss Display:	If the video input stream is lost, you can choose here the screen which should be displayed instead of the video stream. If 'HOLD' is chosen, the decoder displays the last video frame of the buffer as a frozen frame. If 'COLORBAR' is chosen, the decoder displays a colorbar with a 1 kHz audio tone. If 'B/W TEXT' is chosen, the decoder displays a black screen which contains the display status message 'STREAM LOSS'.
Enable Config Mode:	Enables / Disables the port 2323 for remote controlling. For more information, please see chapter 4.1 on page 44.
Stream Mode:	Displays the stream mode of the received stream. (Read only field)
Bytes Received:	Displays the number of Bytes that have been received. (Read only field)

Table 5: Description of the 'DECODER/SETTINGS' webpage of the DEC-200™

3.4.2 Menu: Decoder / Transport

In the 'DECODER/TRANSPORT' menu, you are able to specify which PIDs the decoder should receive (This Feature is not implemented in the moment).

PID stands for Packet Identifier:
The PIDs help to identify and locate the elementary signals in a stream containing lots of different information and signals (audio, video and data). This is necessary due to the multiplexed nature of transport streams.

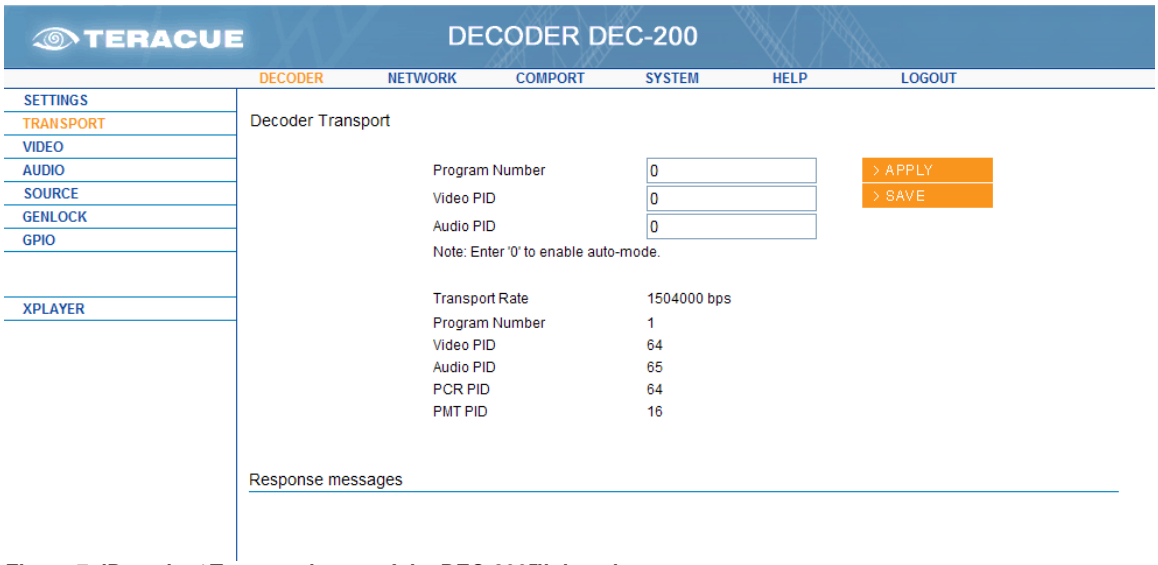


Figure 7: 'Decoder / Transport' page of the DEC-200™ decoder

Table 6 describes the 'Decoder / Transport' page of the DEC-200™ decoder, see Figure 7.

Settings:	Description:
Program Number:	Specifies the program number. The DEC-200™ recognizes the manual mode by entering of the desired program number. To change back the automatically mode, enter in the text field the value '0' and confirm this entry with the 'APPLY' button.
Video PID:	Specifies the video packet identifier of the video which should be displayed (e. g. a stream contains several videos). The DEC-200™ recognizes the manual mode by entering of the desired video PID. To change back the automatically mode, enter in the text field the value '0' and confirm this entry with the 'APPLY' button.
Audio PID:	Specifies the audio packet identifier of the audio which should be played (e. g. a stream contains several audios). The DEC-200™ recognizes the manual mode by entering of the desired audio PID. To change back the automatically mode, enter in the text field the value '0' and confirm this entry with the 'APPLY' button.
Transport Rate:	Displays the transport rate of the received stream. (Read only)
Program Number:	Displays the program number of the received stream. (Read only)
Video PID:	Displays the video PID of the received stream. (Read only)
Audio PID:	Displays the audio PID of the received stream. (Read only)
PCR PID:	Displays the PCR (Program Clock Reference) packet identifier of the received stream. (Read only)
PMT PID:	Displays the PMT (Program Map Table) packet identifier of the received stream. (Read only)

Table 6: Description of the 'DECODER/TRANSPORT' webpage of the DEC-200™

3.4.3 Menu: Decoder / Video

Figure 8 shows the 'Decoder / Video' page of the DEC-200™ decoder.

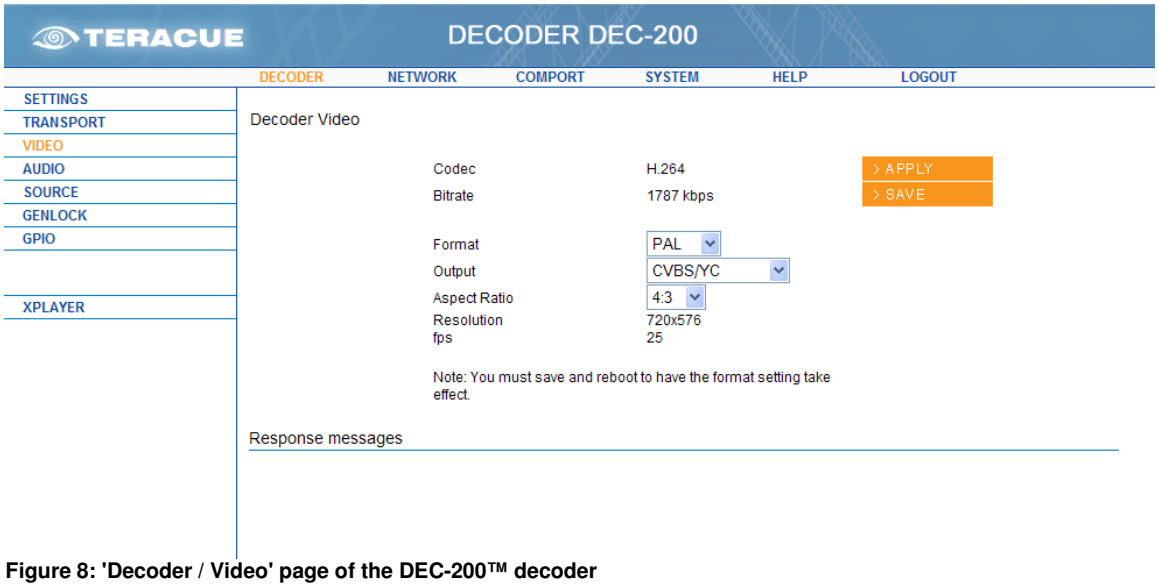


Figure 8: 'Decoder / Video' page of the DEC-200™ decoder

Table 7 describes the 'Decoder / Video' page of the DEC-200™.

Settings:	Description:
Codec:	Displays the video codec of the received stream. (Read only field)
Bitrate:	Displays the video bitrate in KBit/s of the received stream. (Read only field)
Format:	Specifies the colour encoding system of the received video. You can choose between: ▪ PAL ▪ NTSC **.!. Changes in this field require a reboot.**
Output:	Specifies the video output which is available on the Sub-D 26-pin connector or on the BNC connector of the front panel. You can choose between: ▪ CVBS/YC (also known as COMP/YC) ▪ RGB ▪ COMPONENTS (= YP_bP_r) ▪ CVBS(BNC) (via BNC on the front panel; note chapter 4.5) **.!. If you want to have a SDI output on the BNC connector of the front panel, you must only put the mini-jumper on the right position without changing any setting in this field, note therefor chapter 4.5.**
Aspect Ratio:	Specifies the aspect ratio of the connected display. You can choose between: ▪ 4:3 ▪ 16:9 ▪ Auto (the input stream must have set the WSS flag)
Resolution:	Displays the resolution of the received stream. (Read only field)
Fps:	Displays the framerate in fps of the received stream. (Read only field)

Table 7: Description of the 'DECODER/VIDEO' webpage of the DEC-200™

3.4.4 Menu: Decoder / Audio

Figure 9 shows the 'Decoder / Audio' page of the DEC-200™ decoder.

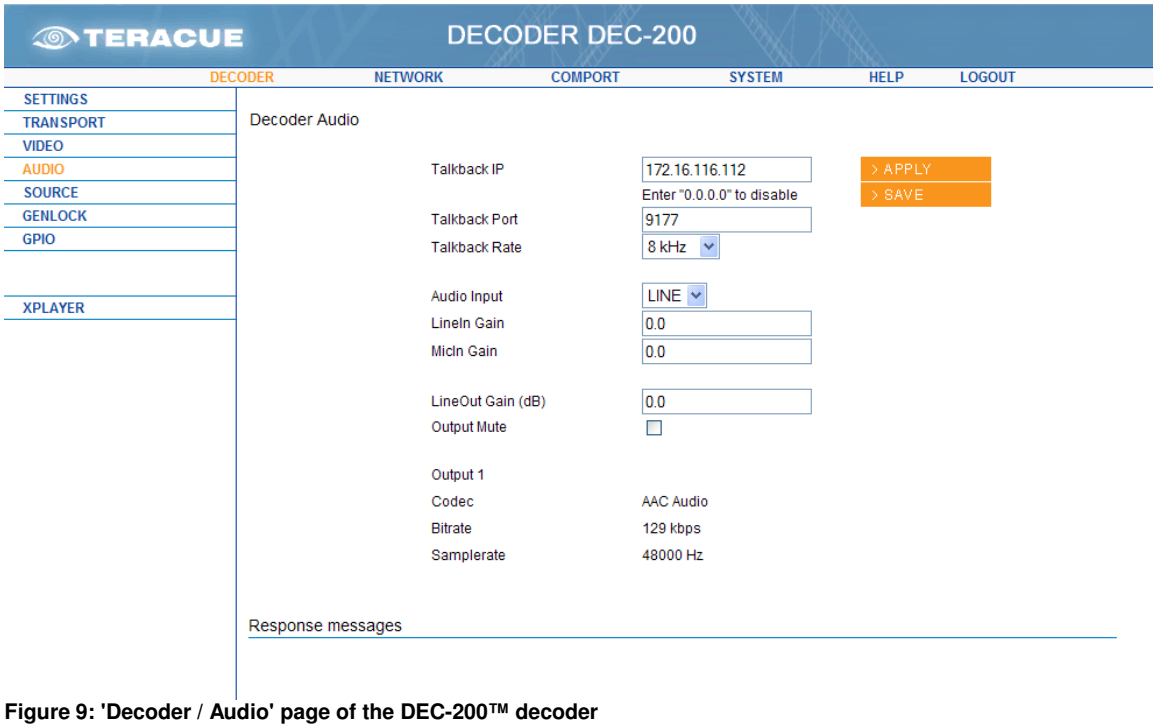


Figure 9: 'Decoder / Audio' page of the DEC-200™ decoder

Table 8 describes the 'Decoder / Audio' page of the DEC-200™.

Settings:	Description:
Talkback IP:	Specifies the IP-address of the encoder with which the DEC-200™ should start the talkback session. For example: A DEC-200™ should start a talkback session with an ENC-100™. The encoder has the IP-address 172.16.20.100. So you must enter in the 'Talkback IP' field of the DEC-200™ the IP-address of the encoder, in this case 172.16.20.100. If you want to turn off the talkback function, please enter the value '0.0.0.0' in this field and click the '>APPLY' button. For more information about the talkback feature, please see chapter 4.2.
Talkback Port:	Specifies the port number of the talkback channel. For a talkback session the encoder and the decoder must have the same talkback port number. At the ENC-100™ the talkback port is 9177 and can not be changed there. For more information about the talkback feature, please see chapter 4.2.
Talkback Rate:	Specifies the talkback sample rate. For a talkback session the encoder and decoder must have the same sample rate. For more information about the talkback feature, please see chapter 4.2.
Audio Input:	Specifies the audio input for the talkback function. You can choose between microphone (MIC) input and line (LINE) input. For more information about the talkback feature, see chapter 4.2.
LineIn Gain:	Specifies the line level gain for the talkback function. For more information about the talkback feature, please see chapter 4.2.
MicIn Gain:	Specifies the microphone level gain for the talkback function. For more information about the talkback feature, see chapter 4.2.
LineOut Gain:	Specifies the line level gain for the audio output.
Output Mute:	Enables / Disables muting the audio output.
Codec:	Displays the audio codec of the received stream. (Read only)

Bitrate:	Displays the audio bitrate (KBit/s). (Read only)
Samplerate:	Displays the audio sample rate (Hz) of the received stream. (Read only)

Table 8: Description of the 'DECODER/AUDIO' webpage of the DEC-200™

3.4.5 Menu: Decoder / Source

DEC-200™ is capable to receive a stream either as a unicast stream or a multicast stream. According to the entered source IP-address, the decoder will automatically recognize whether it concerns about a unicast or multicast stream.

Figure 10 shows the 'Decoder / Source' page of the DEC-200™ decoder.

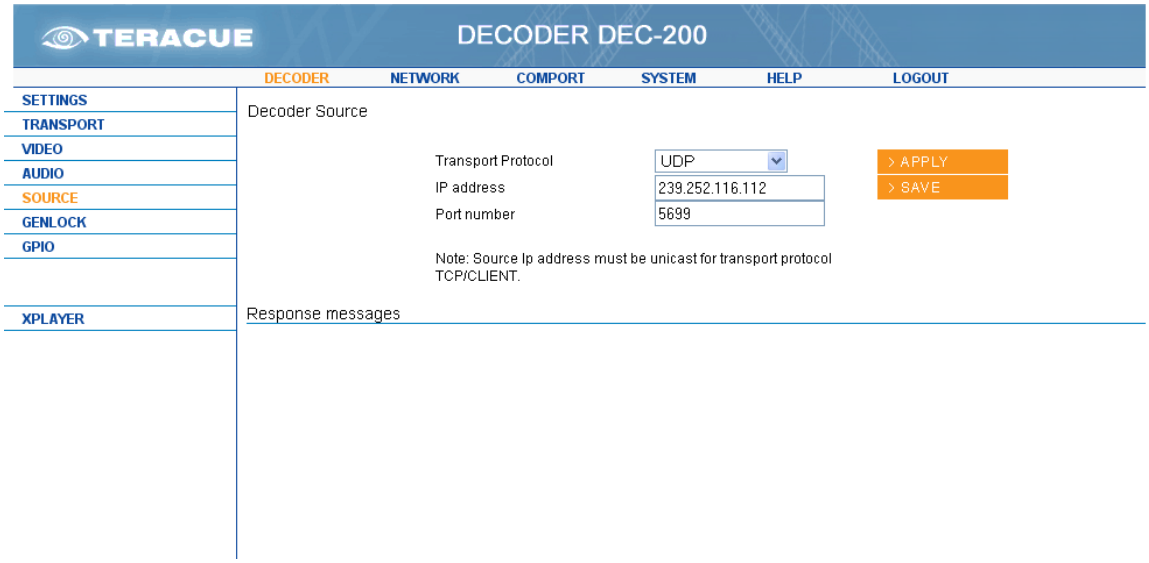


Figure 10: 'Decoder / Source' page of the DEC-200™ decoder

Table 9 describes the 'Decoder / Source' page of the DEC-200™.

Settings:	Description:
Transport Protocol:	Specifies the transport protocol. Specifies the transport protocol. You can choose between the connectionless protocol UDP and the connection-oriented protocol TCP. If you use TCP, your source must also support the TCP protocol. Furthermore, no multicast is supported when using TCP. If you choose 'TCP/SERVER', your source must be the client. If you choose 'TCP/CLIENT', your source must be the server. For more information, please see chapter 4.3 on page 52. **.!. If network errors occur in your network, we recommend using TCP protocol.**
IP address:	Specifies the stream which should the DEC-200™ receive. If you want to receive a multicast stream: Please enter in the 'IP address' field your desired multicast IP-address, e. g. 239.252.20.100. If you want to receive a unicast stream: Please enter in the 'IP address' field the IP-address of the source, e. g. the IP-address of the ENC-100™, see Figure 11.
Port number:	Specifies the port number of the stream which should the DEC-200™ receive. Enter in this field the port number of your desired stream.

Table 9: Description of the 'DECODER/SOURCE' webpage of the DEC-200™

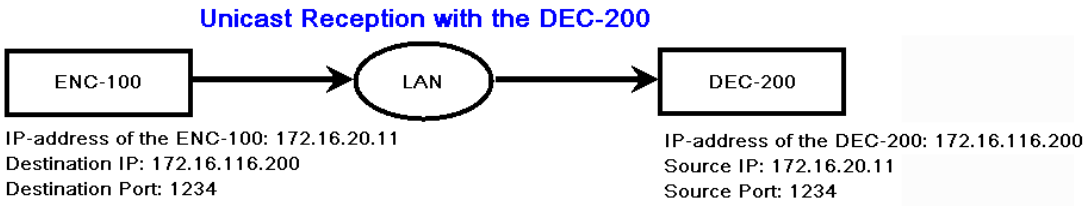


Figure 11: Unicast connection between ENC-100™ and DEC-200™

3.4.6 Menu: Decoder / Genlock

It is also possible to feed in a Genlock signal to synchronise the DEC-200™ from external device. When you have connected the Genlock signal, you must define the Genlock settings in the Genlock webpage of the DEC-200™. Figure 12 shows the 'Decoder / Genlock' page of the DEC-200™ decoder.

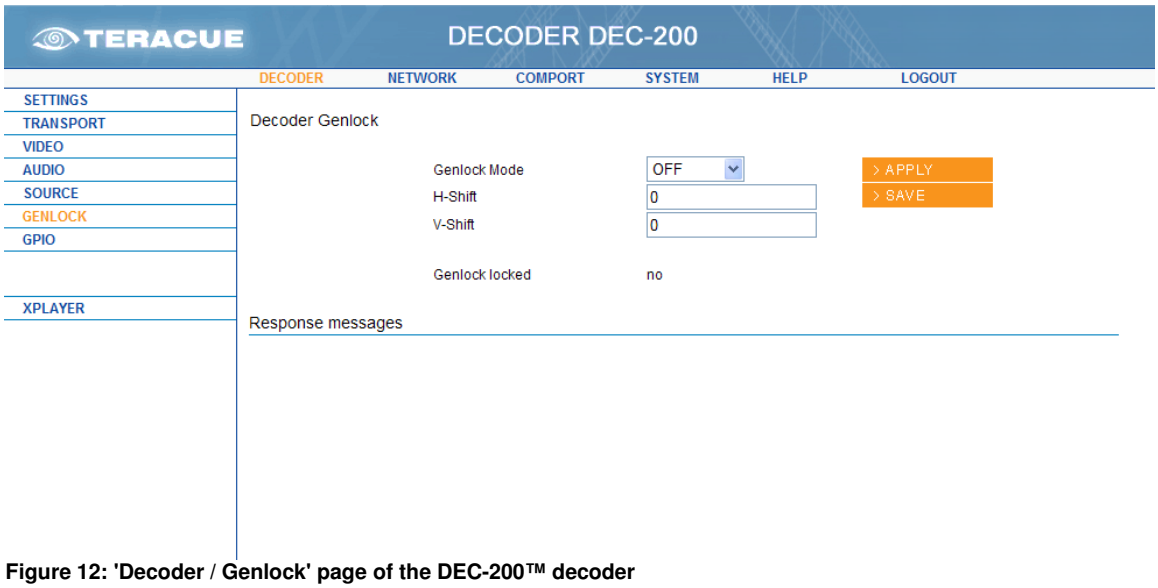


Figure 12: 'Decoder / Genlock' page of the DEC-200™ decoder

Table 10 describes the 'Decoder / Genlock' page of the DEC-200™.

Settings:	Description:
Genlock Mode:	The Genlock mode specifies whether the Genlock is enabled / disabled and whether the DEC-200™ gets the Genlock signal from the front panel or from the backplane. ▪ OFF = Genlock is disabled ▪ ON = Genlock is enabled and the Genlock signal is exclusively fed in via the breakout cable. ▪ MASTER = Genlock is enabled; the Genlock signal is fed in via the breakout cable and is forwarded to the backplane. ▪ SLAVE = Genlock is enabled and the Genlock signal is exclusively fed in via the backplane.
H-Shift:	Specifies the horizontal shift value. Please choose a value between +/ – 1000.
V-Shift:	Specifies the vertical shift value. Please choose a value between +/ – 1000.
Genlock locked:	Displays the status of the Genlock input: ▪ YES = Genlock signal is present at the input ▪ NO = Genlock signal is missing at the input

Table 10: Description of the 'DECODER/GENLOCK' webpage of the DEC-200™

3.4.7 Menu: Decoder / GPIO

The General Purpose Input/Output (GPIO) supports a GPI function for the pass-through mode to control devices which are connected with another DEC-200™ decoder or ENC-200™ encoder. Furthermore it supports a GPO function for the manual mode to send a signal to a device which is directly connected to the decoder via the GPIO D-Sub connector of the breakout cable 'P'.
This allows users to connect a special device, e.g. sensor to the GPIO Port and send from the decoder a signal to control the special device.

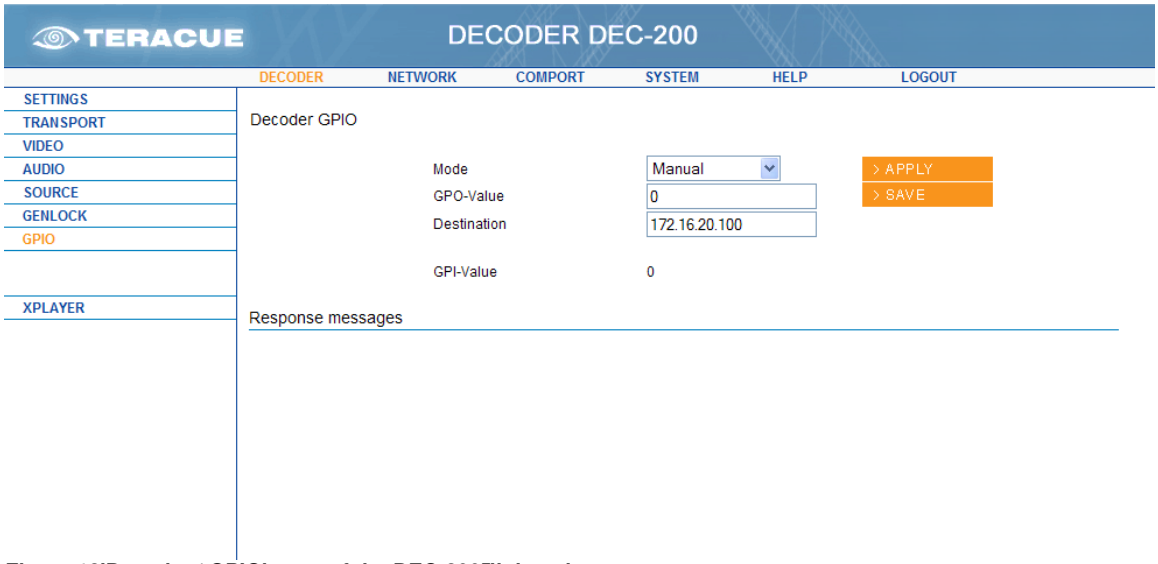


Figure 13'Decoder / GPIO' page of the DEC-200™ decoder

Settings:	Description:
Mode:	Specifies the GPIO mode. You can choose between 'Manual', 'Passthrough/A' and 'Passthrough/B'. **'Manual'** switches the local GPO value to the level high (=1) or low (=0). The high or low level must be entered in the 'GPO-Value' field. **'Passthrough/A'** and **'Passthrough/B'** forward the high (=1) or low (=0) level via UDP to another encoder or decoder at which a device is connected. Therefor the IP-address of the destination encoder/decoder must be entered in the 'Destination' field. The difference between 'Passthrough/A' and 'Passthrough/B' is that the GPO value of 'Passthrough/B' is inverted. 'Passthrough/A' and 'Passthrough/B' has the following states:
GPO-Value:	Specifies the GPO high or low level. '0' indicates the low level and '1' indicates the high level. This field is only in use, when the mode is set to 'Manual'.
Destination:	Specifies the IP-address of the destination encoder/decoder to which the high/low level shall be forwarded. This field is only in use, when the mde is set to 'Passthrough/A' or 'Passthrough/B'.
GPI-Value:	Shows the high/low level which the decoder gets. Read only field.

Passthrough Parameter:	DEC-200 GPI:	ENC-200 GPO:	RS422-200 OUT:
Passthrough/A	1	1	Relay Close
	0	0	Relay Open
Passthrough/B	1	0	Relay Open
	0	1	Relay Close

Table 11: Description of the 'DECODER/GPIO' webpage of the DEC-200™

The GPIO D-Sub Connector of the breakout cable 'P' has the following pin assignment.

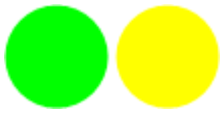
Pin:	GPIO Assignment:
1	NC
2	NC
3	NC
4	3.3V
5	GND
6	NC
7	GPO
8	GPI
9	NC

Table 12: Assignment of the GPIO Sub-D Connector of the Breakout Cable 'P'

.!. GPIO are TTL compatible. Furthermore the GPO output can tide maximum 24 mA. Maximum current is 24 mA. The GPIO is temporary short-circuit-proof.

.!. The GPIO of the DEC-200 has TTL logic.

.!. IMPORTANT INFORMATION about a DEC-200 board modification:



All DEC-200 boards, which have a yellow and green sticker at the boards, are modified and have the following characteristics: The 3.3V output has no series resistor inside, but the 3.3V output has a safety fuse. The non-operating state of GPI is 1. To change the GPI value to 0, you must set GPI to GND. A series resistor is not needed at the DEC-200. The non-operating state of GPO is 0 (= 0V, TTL = low). If GPO is 1 (TTL = high), the GPO has an output voltage of 5V.

.!. **IMPORTANT INFORMATION about DEC-200 boards:**
All DEC-200 boards, which have not a yellow and green sticker at the boards, are not modified and have the following characteristics: The 3.3V output has a series resistor (1 kΩ) inside. The non-operating state of GPI is 0. To change the GPI value to 1, you must feed the GPI with 5V. A series resistor is not needed at the DEC-200. The non-operating state of GPO is 0 (= 0V, TTL = low). If GPO is 1 (TTL = high), the GPO has an output voltage of 5V.

.!. For an error-free GPIO operation in passthrough mode, both, the GPI source and the GPO destination must be configured correctly. That means, the source and the destination must be set to the identical passthrough mode, the correct IP-address of the GPO destination must be entered in the source and the correct IP-address of the GPI source must be entered in the destination. Furthermore, as long as the GPIO mode is set to 'Manual' the GPI is blocked.

NC = Not Connected

3.4.8 Menu: Decoder / XPlayer

The menu ‘XPlayer’ starts the ‘Standalone XPlayer’, if an ‘XPlayer’ is installed on the client PC. The XPlayer-Link was added to check whether the entered source is available in the network. You can start the ‘XPlayer’ by clicking the XPlayer-Link inside the ‘Decoder’ menu.

Afterwards the ‘XPlayer’ automatically displays the input stream, which you have entered in the ‘Decoder / Source’ page of the DEC-200™ decoder.

Figure 14: 'Decoder / XPlayer' page with opened XPlayer

If the XPlayer is not installed on the client PC, the XPlayer-Link will have no function.

.!. Requirement for this feature: The XPlayer must be installed.

3.4.9 Menu: Network / Settings

Figure 15 shows the 'Network / Settings' page of the DEC-200™ decoder. Here you are able to set the decoder's own IP-address, subnet mask, gateway address and define the decoder's host name.

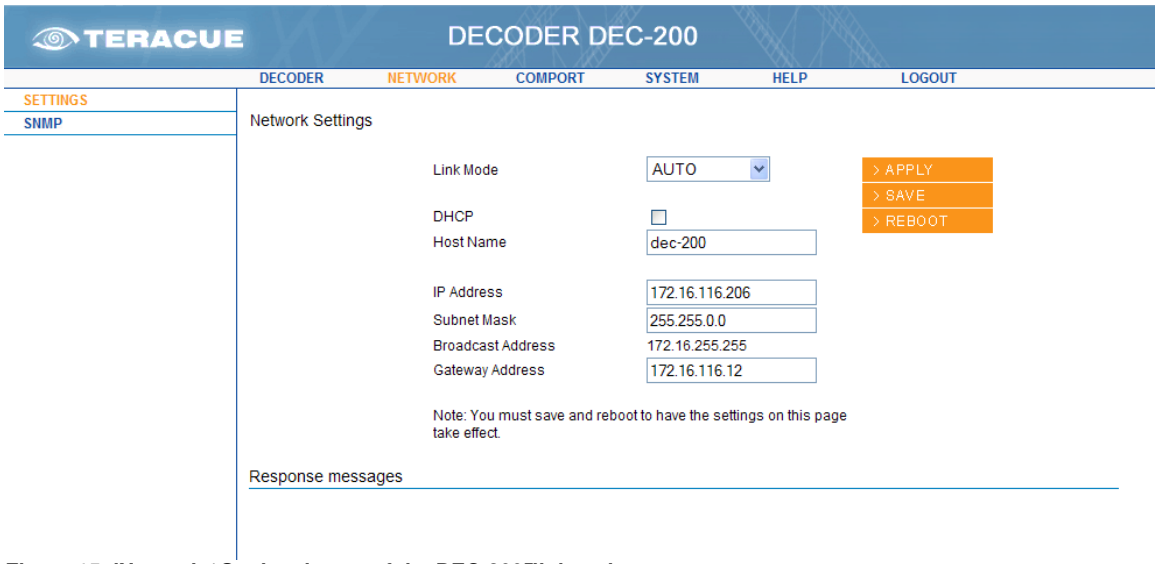


Figure 15: 'Network / Settings' page of the DEC-200™ decoder

Table 13 describes the 'Network / Settings' page of the DEC-200™.

Settings:	Description:
Link Mode:	Specifies the network port characteristics of the DEC-200™. This option has been added especially to address specialized network and/or administration requirements. **.!. In most cases it is sufficient (and recommended) to leave this setting on 'AUTO', so the DEC-200™ and the connected switch can deal out the preferred connection on their own.**
DHCP:	Enables / Disables DHCP. Only use this option if you are familiar with DCHP and your network supports DCHP. Please note also the information in the known issues (chapter 9, on page 62).
Host Name:	Specifies the hostname of the DEC-200™. Please enter your desired hostname of the DEC-200™.
IP Address:	Specifies the IP-address of the DEC-200™. The IP-address is an identifier for your DEC in the TCP/IP network. Networks use the TCP/IP protocol route messages based on the IP-address of the destination. The format of an IP-address is a 32-bit numeric address written as four numbers separated by periods. Each number can range from 0 to 255. E.g.: 172.16.20.200
Subnet Mask:	Specifies the subnet mask of the DEC-200™. A subnet mask is a 32-bitmask used to divide an IP-address into subnet and specify the networks available hosts. E.g.: 255.255.0.0 is the net mask for a class-B IP-address like 172.16.20.200.
Broadcast Address:	Displays the broadcast IP-address. (Read only field)
Gateway Address:	Specifies the IP-address of your gateway. The gateway is commonly the address of the network device such as a network router.

Table 13: Description of the 'NETWORK/SETTINGS' webpage of the DEC-200™

.!. **When the IP-address has been changed, the decoder needs to be reset (reboot), in order for the new IP-address to take effect. When changing the IP-address please type in the new IP-address, subnet mask, gateway-address and host name. Then hit the 'SAVE' button and then the 'REBOOT' button.**

.!. **If the decoder has lost his network connection, the decoder displays always on the screen a black screen, which contains the status message 'NETWORK LOSS'.**

3.4.10 Menu: Network / SNMP (Simple Network Management Protocol)

The Simple Network Management Protocol enables you to monitor and/or configure network attached devices like the DEC-200™, made possible by the installed SNMP agents.

Every DEC-200™ since Firmware Version 1.37 is delivered with an SNMP agent. All you need are the MIB (Management Information Base) files. With these MIB files you can use all advantages of SNMP associated with the DEC-200™.

You can find the appropriate MIB files, 'TERACUE-DEC200-MIB.txt' and 'TERACUE-SNMP-MIB.txt' on the Teracue website IPTV Support Area. Or contact support@teracue.com.

With these MIBs and a SNMP manager, you have the possibility, to monitor the DEC-200™ status (by SNMP traps) or remotely configure every function of the DEC-200™ similar to the normal access via your web browser. There are various SNMP management-tools available to issue SNMP based commands to the appliance (Software not supplied by Teracue).

.!. Set your SNMP manager to SNMPv2.

Teracue uses the MIB Browser by iReasoning to monitor/set up the DEC-200™. iReasoning offers a free version of the MIB Browser under www.ireasoning.com, which is useful to read the actual status or setting up the DEC-200™. See further information about the MIB Browser of iReasoning in chapter 3.4.10.1 on page 33.

SNMP uses the following standard ports: Port 161 and port 162. Port 161 is used by the SNMP manager and the agent to send the requests and their responses. Port 162 is used by the SNMP agent to send TRAPs to the SNMP manager. Make sure that these ports are not blocked in your network.

The following operations are possible with SNMP:

GET: Read out the management information.
GETNEXT: Read out the management information iteratively, this is useful when you want to read the information down the MIB tree step by step.
GETBULK: Read out the management information of the complete list/tree.
SET: Change/set the management information.
TRAP: Start the Trap receiver in your SNMP manager to get alerts of the managed system. E.g. the encoder was started / stopped.

To use the DEC-200™ SNMP features, you have to set up the encoder, to establish access with your SNMP manager. See Figure 16.

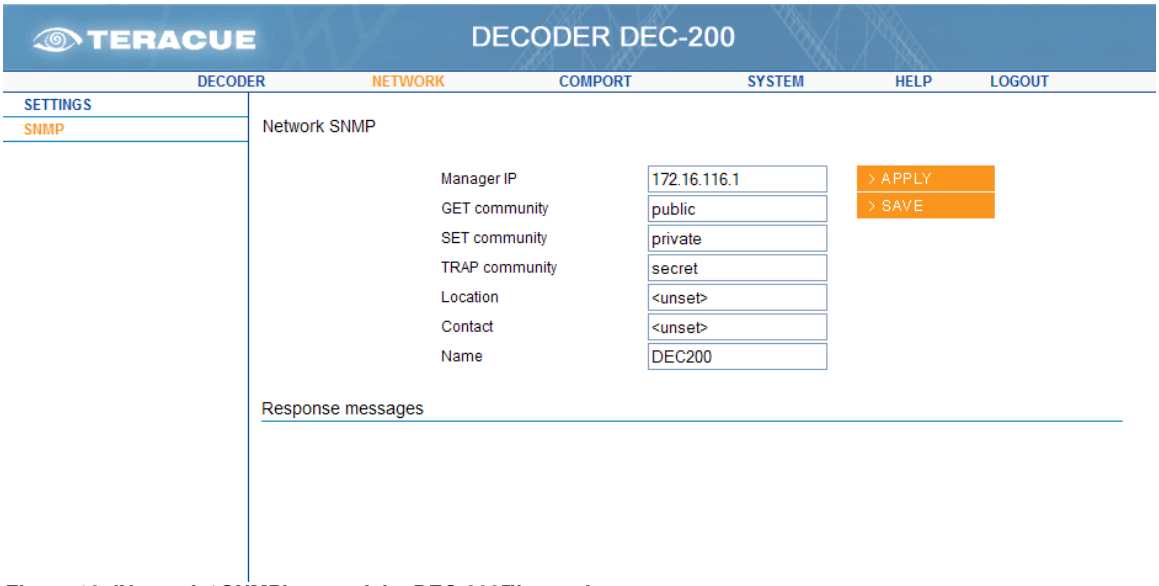


Figure 16: 'Network / SNMP' page of the DEC-200™ encoder

Settings:	Description:
Manager IP:	Specifies the IP-address of the Client PC on which the SNMP manager (TRAP Receiver) is installed. This field must be configured, to receive TRAPs.
GET community:	Specifies the password for the GET community, which you must enter in your SNMP manager in the Read Community field. **.!. We recommend leaving the default value 'public'.**
SET community:	Specifies the password for the SET community, which you must enter in your SNMP manager in the Write Community field. **.!. We recommend leaving the default value 'private'.**
TRAP community:	The TRAP community describes a community string similar to the GET and SET community string, but for Traps. The SNMP TRAP server can find out whether the received TRAP message was sent by an authorized client or not.
Location:	Specifies the location of the SNMP-node in the network.
Contact:	Specifies the name of the contact person/administrator who is responsible for this device.
Name:	Specifies the FQDN (Fully Qualified Domain Name) or the hostname of the device.

Table 14: Description of the 'NETWORK/SNMP' webpage of the DEC-200™

The fields 'Location', 'Contact' and 'Name' describe the common SNMP-parameters (sysLocation, sysContact and sysName) supported by every SNMP device. These details help you to find and identify SNMP devices like the DEC-200™ in a network.

The SNMP elements use traps as SNMP base messages to report changes in status or alarm conditions to remote SNMP management entities. Normally traps are used to alarm network administrators of possible equipment problems or other important events. There are two types of information sent by the trap device: 'Events' and 'Alarms'.

'Event' traps will be sent if a monitored event occurs. These traps have only one state.
'Alarm' traps are events that have two states: Active and Clear. An 'Active' trap will be sent if an alarm condition will be detected. The alarm will be kept active until the condition cleared and a 'Clear' trap was send.

Table 15 describes the supported traps of the DEC-200™:

Trap Name:	Description:
DEC200StreamLockStatus:	This trap is sent when the 'Stream locked' status of the DEC-200™ has changed. The trap contains the new status variable (yes/no).
DEC200DecodingStatus:	This trap is sent when the 'Decoding' status of the DEC-200™ has changed. The trap contains the new status variable (yes/no).
DEC200GpioStatus:	This trap is sent when the 'GPIO' status of the DEC-200™ has changed. The trap contains the new status value (1/0).
DEC200SourceIpChanged:	This trap is sent when the 'Source IP-address' of the DEC-200™ has changed. The trap contains the new Source IP-address.

Table 15: Description of the DEC-200™ SNMP Traps

3.4.10.1 Setting up the SNMP Manager 'MIB Browser'

To explain the use of SNMP, the following sites will give you a short overview of the possibilities you have via SNMP. The SNMP manager will be explained with the SNMP-manager 'MIB Browser' by iReasoning.

Open the 'MIB Browser' and load the MIB files. Click in den menu on 'File', select 'Load MIB' and choose the folder with the MIB files, see Figure 17.

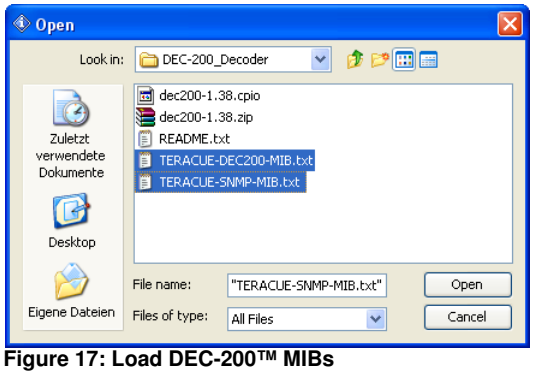


Figure 17: Load DEC-200™ MIBs

.!. You have to load both files: 'TERACUE-DEC200-MIB.txt' and 'TERACUE-SNMP-MIB.txt'.

As next, go to the menu on 'Tools' and select 'Options'. It opens the 'Option' window in which you choose the 'Agents' tab please. See Figure 18.

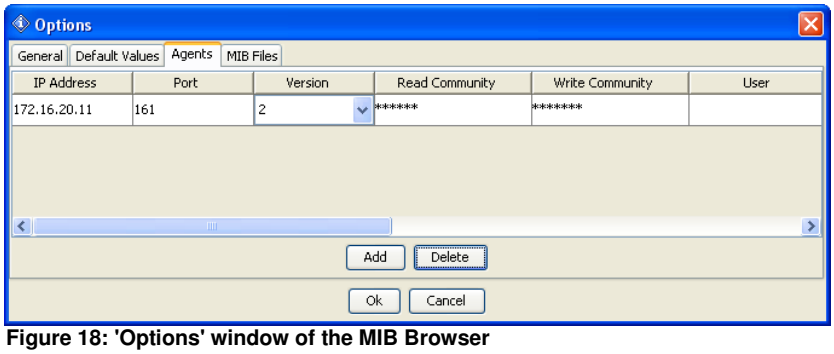


Figure 18: 'Options' window of the MIB Browser

Click in the 'Options' window the 'Add' button. It opens the 'Advanced Properties of SNMP Agent' window to add a new SNMP device. See Figure 19.

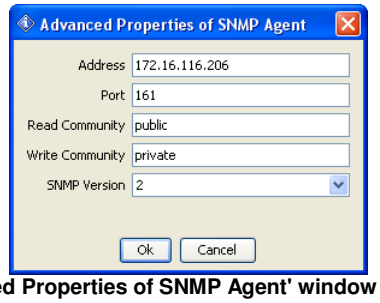


Figure 19: 'Advanced Properties of SNMP Agent' window of the MIB Browser

Table 16 describes the 'Advanced Properties of SNMP Agent' window.

Settings and Buttons:	Description:
Address:	Specifies the IP-address of the SNMP device which should be controlled. For example: The IP-address of the DEC-200™.
Port:	The 'Port' field specifies the port number over which the MIB Browser and the controlled device send the request and their responses. The default port number is 161, which is defined by the SNMP standard. **.!. We recommend not changing this port number.**
Read Community:	Specifies the 'Read Community' password. The default password of the read community for the DEC-200™ is 'public'.
Write Community:	Specifies the 'Write Community' password. The default password of the write community for the DEC-200™ is 'private'.
SNMP Version:	Specifies the supported SNMP version of the controlled device. The DEC-200™ supports the SNMP Version 2.
Ok:	Confirms your settings and creates an agent entry in the 'Agent' tab of the 'Options' window.
Cancel:	Closes the 'Advanced Properties of SNMP Agent' window without saving your settings.

Table 16: Description of the 'Advanced Properties of SNMP Agent' window

If you have created an agent entry in the 'Options' window, you can close the 'Options' window.
After you have loaded the DEC-200™ MIBs and have created an agent entry in the 'Options' window, you are ready to control your DEC-200™ via SNMP.
To control your DEC-200™, please go to the data tree and open the loaded Teracue DEC-200™ MIB which is shown there. The opened sub-tree shows you all the adjustable options, which you also have with the DEC-200™ web interface. See Figure 20.

If you want to control the DEC-200™ via the MIB Browser, right-click at one data tree item, e. g. 'videoBitrate' and select your desired SNMP command (Table 17).

SNMP commands:	Description:
Get:	Read out the management information.
Get Next:	Read out the management information iteratively, which is useful if you want to read the information down the MIB tree step by step
Get Subtree:	Read out the management information of the selected subtree.
Walk (Getbulk):	Read out the management information of the complete list/tree.
Set:	Change/set the management information

Table 17: Description of the SNMP commands

If you choose the SNMP command 'Get', the MIB Browser will show the actual setting of the selected data tree item. E. g. in case of the selected 'OSDActive' item: no (1).

If you choose the SNMP command 'Set', the 'SNMP SET' window appears in which you must enter the new value of the selected data tree item. Choose in the 'Data Type' field the correct data type and enter in the 'Value' field the new value, e.g. 2. You find information about the needed data type in the 'Syntax' field of the item details which are shown in the left bottom of the MIB Browser. See Figure 20.

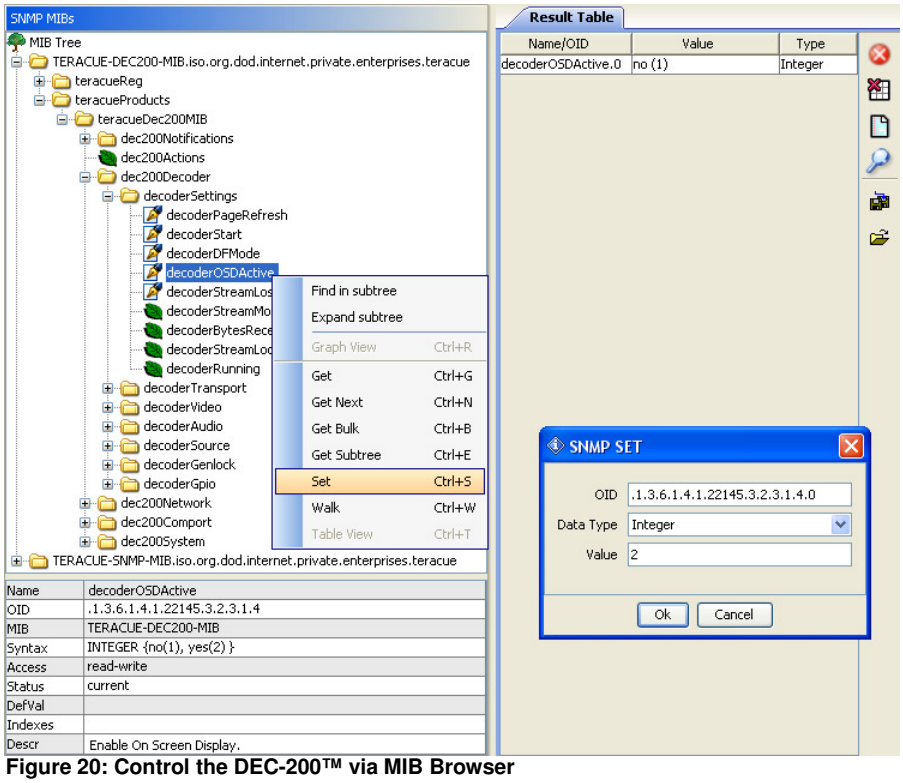


Figure 20: Control the DEC-200™ via MIB Browser

The MIB-Browser shows you also details of your selected data tree item, see Figure 21. This info section is in the left bottom of the MIB-Browser. Figure 21 shows the details of the data tree item 'OSDActive'. The syntax or rather the data type of the 'OSDActive' item is an 'Integer' value which can be either 1 or 2. That means that the value 1 stands for 'no' and the value 2 for 'yes'. Furthermore the info section of the data tree item 'OSDActive' shows you that you have a read-write access. Table 18 describes the information section of the MIB Browser which is shown in Figure 21.

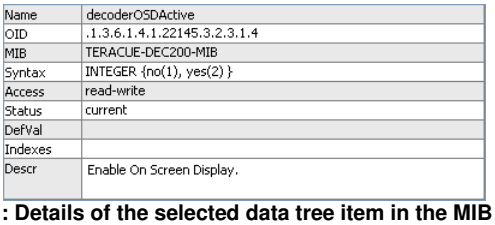


Figure 21: Details of the selected data tree item in the MIB Browser

Information Name:	Description:
Name:	This shows you the name of the selected data tree item.
OID:	The Object Identifier (OID) is the explicit SNMP number of the selected item/function.
MIB:	This shows you the name of the MIB.
Syntax:	**Integer:** Only entries of integer values are possible. **Integer32:** Only entries of integer values with max 32 bit are possible. **Octet String:** Read-only/read-write numbers and characters (e.g. Teracue) are allowed. **IPAddress:** Read-only/read-write numbers in the IP address string (e.g. 172.16.20.100) are allowed.
Access:	The attribute 'read-only' or 'read-write' shows you whether you can change the setting of the selected data tree item or whether you just able to read out the actual setting or state.
Descr:	This field gives a short description of the selected data tree item.

Table 18: Description of the information section of the MIB Browser

3.4.11 Menu: Comport / Settings

The 'comport / settings' webpage defines the parameters for the DEC's integrated comport/serial port. DEC-200™ decoders are always comport clients and ENC-200™ encoders are always comport servers.

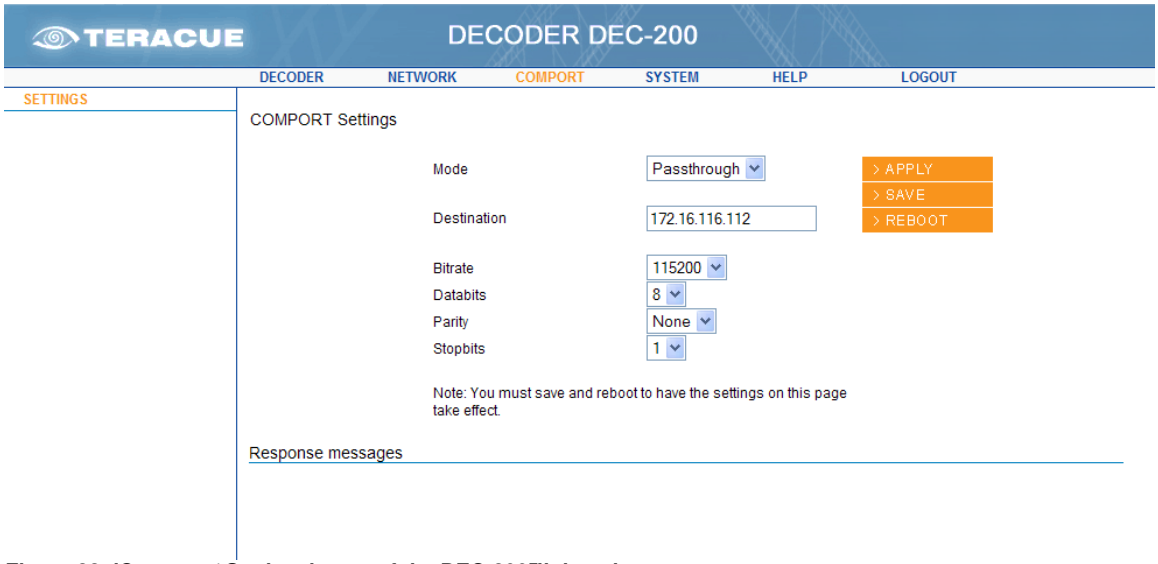


Figure 22: 'Comport / Settings' page of the DEC-200™ decoder

Settings:	Description:
Mode:	Specifies the comport mode. You can choose between 'Console', 'Passthrough' and 'Packet'. **'Console'** enables access and control of the DEC-200™ configuration via the com-cable (null modem cable). Use this cable to set the DEC-200™ configuration when you do not want to use web access. **'Passthrough'** enables setting comport to a serial mode. RS-232 devices can be connected and controlled via comport. This is useful, e. g. when cameras or other non-network devices need to be remotely controlled. RS-232 commands can be tunnelled and sent via TCP/IP to comport client, where they will be returned into native RS-232 commands. When a connection is opened from the client (e.g. decoder) to the IP-address of an encoder (e.g. ENC-200™) at port 7777, the serial function is activated and any data (string) is passed straight to the connected RS-232 device. Once the connection is established, this also works the other way for information coming back from the RS-232 device. **'Packet'** enables the packet mode. The 'Packet' mode enables the tunnelled transmission of data with the compliance of the temporal sequence. This mode is incompatible to other COM Servers or Clients. That means the 'Packet' mode can only be used between ENC-200™ encoders and DEC-200™ decoders. At the 'Packet' mode the transmission transparent and only the parameters of the bitrate and the databits are set fix to 19200 bit/s, 8 databits. Data, which are sent as a block, shall be outputted as a data block without gaps on the receiver side. Data blocks, which are split with a gap, shall not be summarised on the receiver side. Data blocks are sequenced signs with gaps which are smaller than 4 Bytes.
Destination:	Specifies the destination IP-address at which tunnelled RS-232 commands shall be sent. If 'Passthrough' or 'Packet' is chosen as comport mode, here must be entered the destination IP-address.

Bitrate:	Specifies the used bitrate in bits per second.
Databits:	Specifies the databits. You can choose between ‘7’ and ‘8’.
Parity:	Specifies the parity. You can choose between ‘none’, ‘odd’ and ‘even’.
Stopbits:	Specifies the value of used stopbits. You can choose between ‘1’ and ‘2’.

Table 19: Description of the 'COMPORT/SETTINGS' webpage of the DEC-200™

3.4.12 Menu: System / Settings

The menu ‘System/Settings’ displays information about the firmware version that is installed on your DEC-200™.

Among other things you will find information about the system uptime, ARM load and the DSP load. See Figure 23.

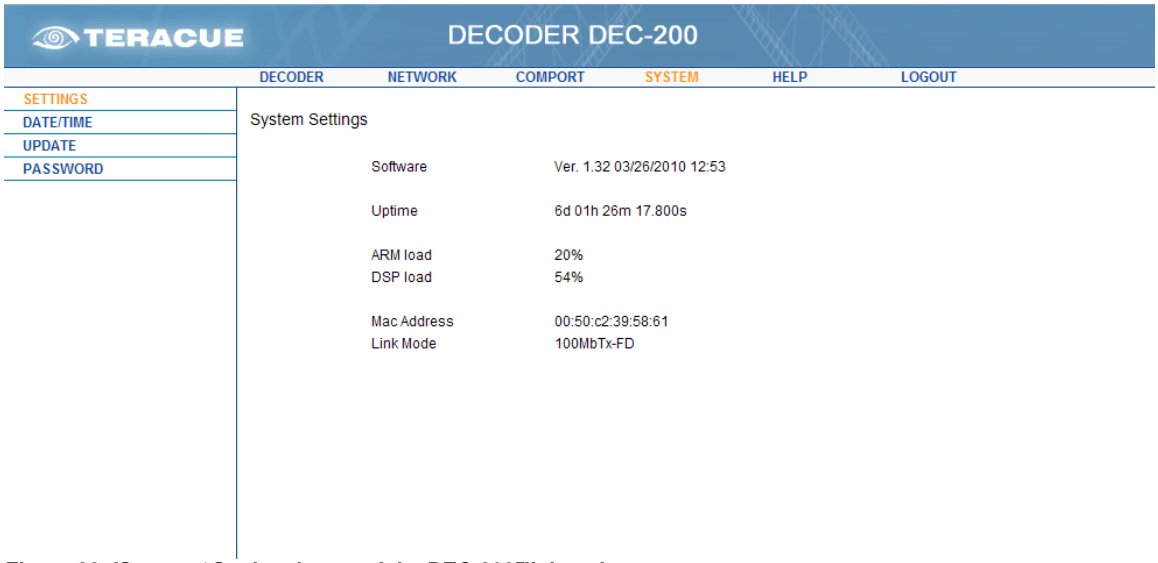


Figure 23: 'System / Settings' page of the DEC-200™ decoder

3.4.13 Menu: System / Date/Time

You can set the time and date for the decoder in the menu ‘System/Date/Time’. See Figure 24.

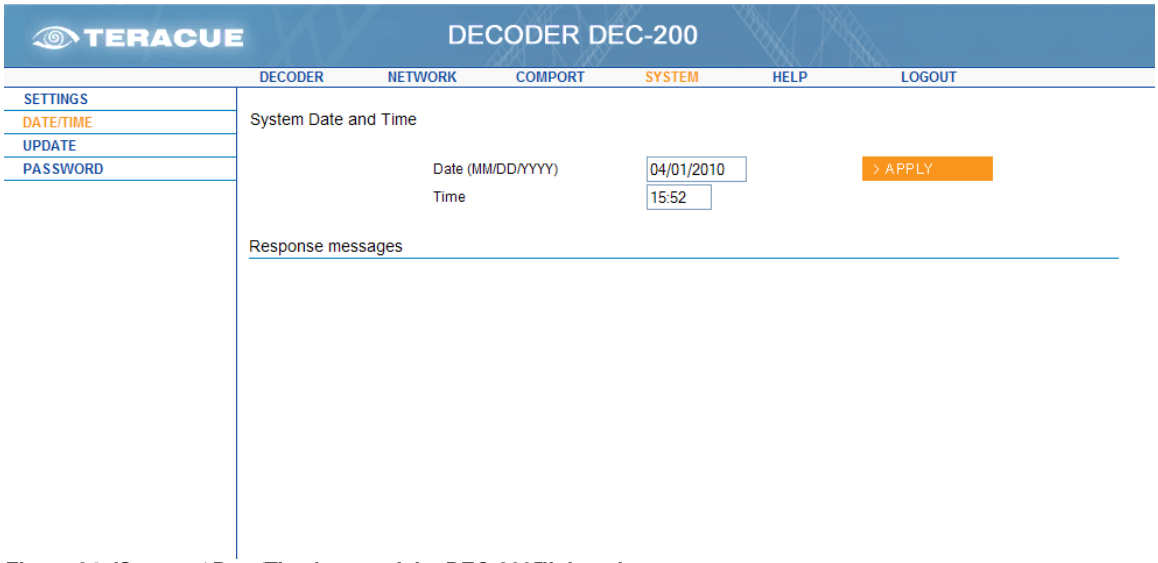


Figure 24: 'System / Date/Time' page of the DEC-200™ decoder

Settings:	Description:
Date (MM/DD/YYYY):	Specifies the current date. Please enter the date in the following syntax MM/DD/YYYY.
Time:	Specifies the current time. Please enter the time in the following syntax hh:mm.

Table 20: Description of the 'SYSTEM/DATE/TIME' webpage of the DEC-200™

3.4.14 Menu: System / Update (Upgrading firmware version)

Teracue's goal is customer satisfaction and constant product improvement. Please check regularly to see if the most recent firmware version is installed on your DEC-200™. Please visit the IPTV Support area on: www.teracue.com.

Firmware versions can be downloaded from the Teracue support website listed above. Firmware versions have the suffix *.cpio.

Download the correct firmware version that you wish to update your decoders with and save it locally on your computer.

Open the configuration webpage of the DEC-200™ and select the submenu 'UPDATE' within the menu 'SYSTEM', see Figure 25.

Click on the 'Browse' button to locate the cpio-file on your local hard drive. Hit 'OK' and the path to the file will be listed in the box in the middle of the screen.

To start the firmware update procedure simply click on the 'send' button.

After you have started the firmware update a hint website appears, that you shall not disconnect the decoder from the network or power down the decoder. During the firmware update the decoding process stops. Please wait till your web browser shows login screen from your decoder. If the login screen appears, the update is finished and you can login to your decoder. It is no rebooting necessary. The decoding process starts automatically after the firmware update is finished.

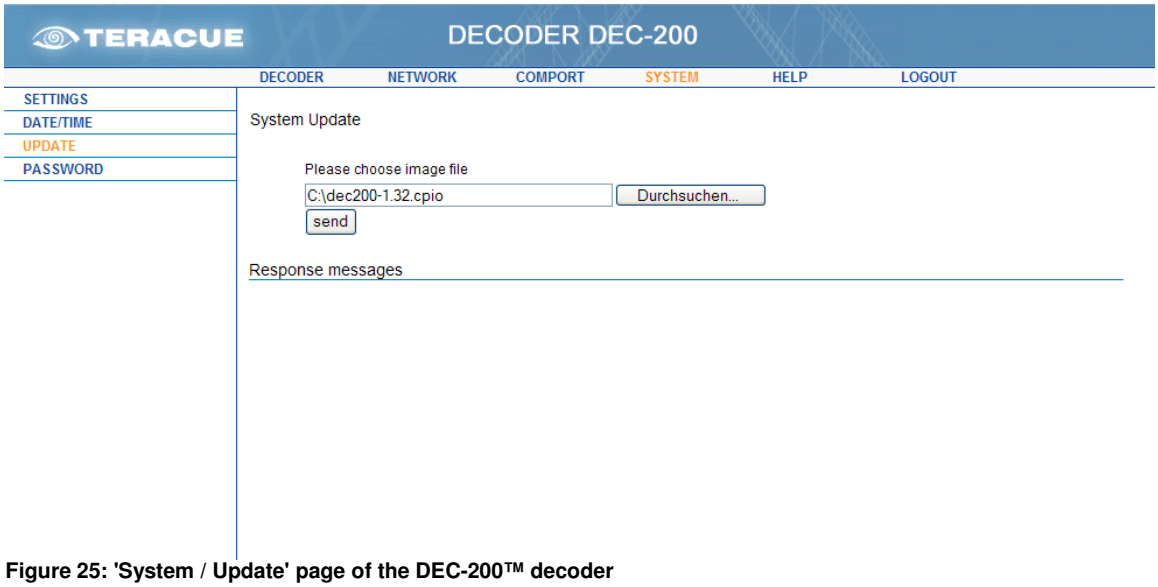


Figure 25: 'System / Update' page of the DEC-200™ decoder

.!. The update will not change your current settings.
.!. During update time do not disconnect the decoder from the network or the power. Doing so will harm your decoder!
.!. Trying to connect to the decoder or navigating on the configuration webpages during the updating process can also harm your decoder.

3.4.15 Menu: System / Password

Figure 26 shows the 'System / Password' page of the DEC-200™ decoder.

If you do need to change the password due to security issues, then simply click on the submenu 'PASSWORD' and enter the new password twice in the provided boxes. Then hit the 'APPLY' button.

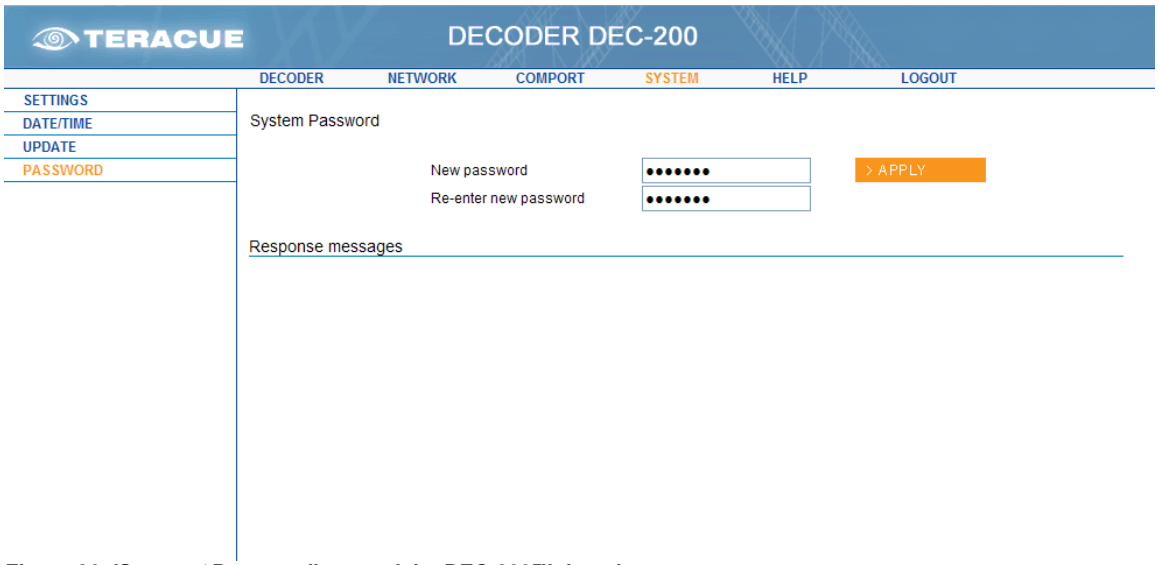


Figure 26: 'System / Password' page of the DEC-200™ decoder

.!. Unless your decoder is used in very critical scenarios, we recommend to leave the password set to its default value ('admin', 'admin').

3.5 Help

Clicking on the 'HELP' button will open the Teracue DEC-200™ user manual (this document) directly from the Teracue website.

Your DEC-200™ automatically connects to open the most current version of the user guide.

.!. This will only work if the decoder is situated in a network in which internet access is provided. Otherwise 'page not found' may be displayed.

3.6 Logout

After having made adjustments to the decoder, please be sure to logout, see Figure 27.

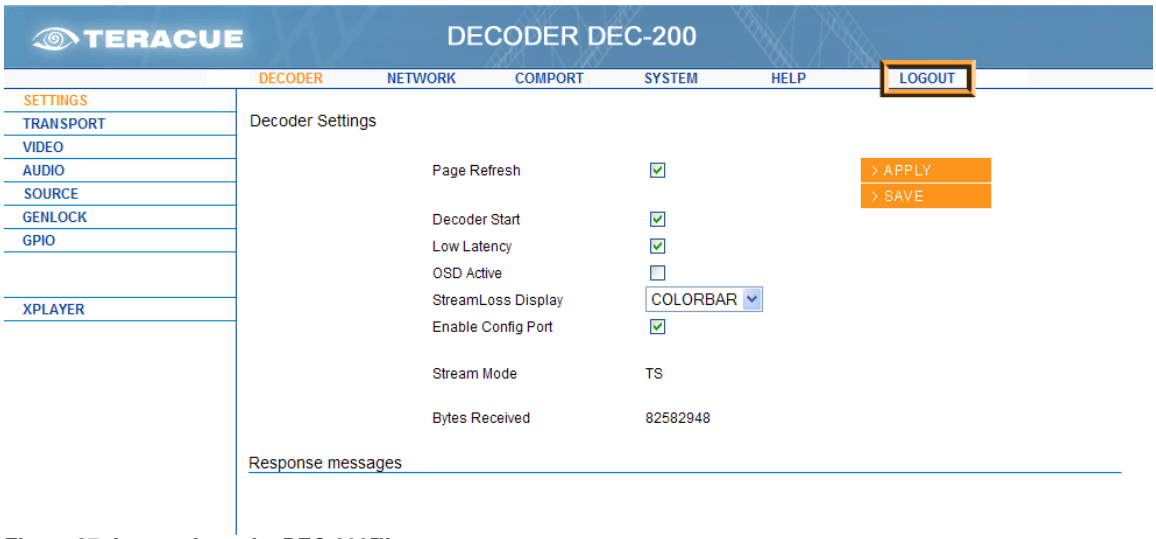


Figure 27: Logout form the DEC-200™

.!. Logging out prevents misuse and unauthorized access to the DEC-200™.

4. Extended Function

4.1 Remote Control

This chapter describes the remote control of the DEC-200™ for media controls like Crestron or AMX. To control the DEC-200™, the telnet protocol is used at the port number 2323. Furthermore here is no login necessary.

To test the remote control under windows you can open the command prompt tool. A practical way to open a command window within Windows Explorer is to write C:\Windows\system32\cmd.exe.
Another way to open a new commando prompt is by choosing the Start menu and selecting **'Run'**. Then write **'cmd'** in the text field and press the **'OK'** button. See Figure 28.

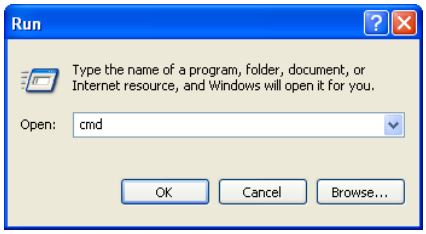


Figure 28: Command to open the command prompt

In both cases the following window opens, see Figure 29.

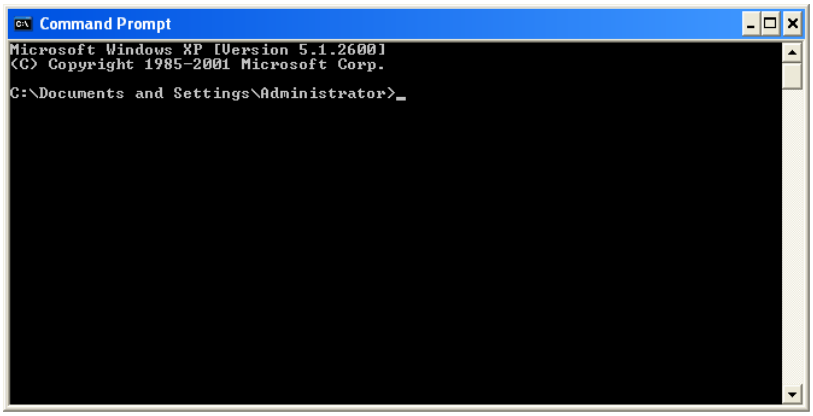


Figure 29: 'Command Prompt' window to test the remote control of the DEC-200™

For starting a telnet session type: telnet <ip-address> <2323>, e.g. 'telnet 172.16.20.200 2323', and press the Enter button. See Figure 30.

The value '2323' specifies the used TCP/IP port number for the telnet session of the remote control test. The IP-address should correspond to the DEC's IP-address.

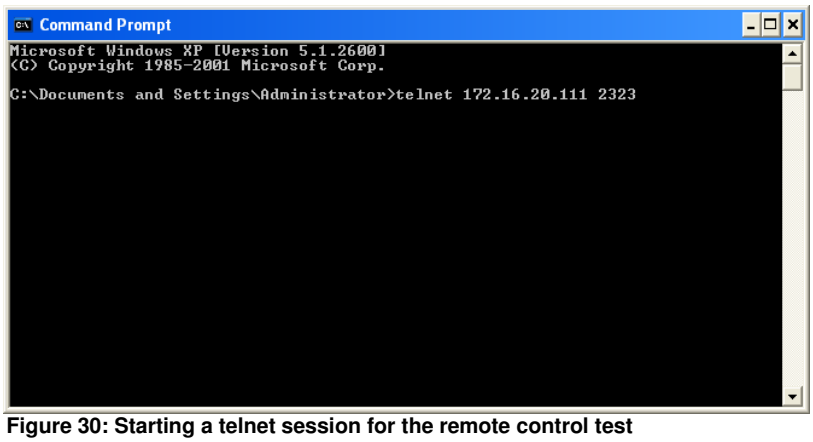


Figure 30: Starting a telnet session for the remote control test

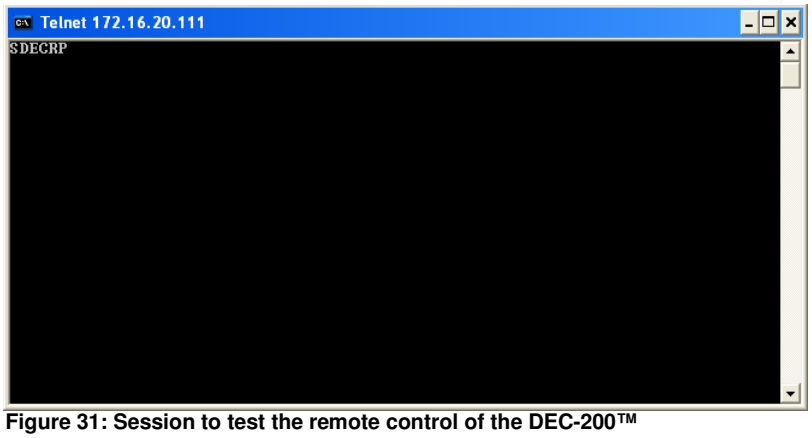


Figure 31: Session to test the remote control of the DEC-200™

After you have start the session, you got the display, see Figure 31: SDECRP

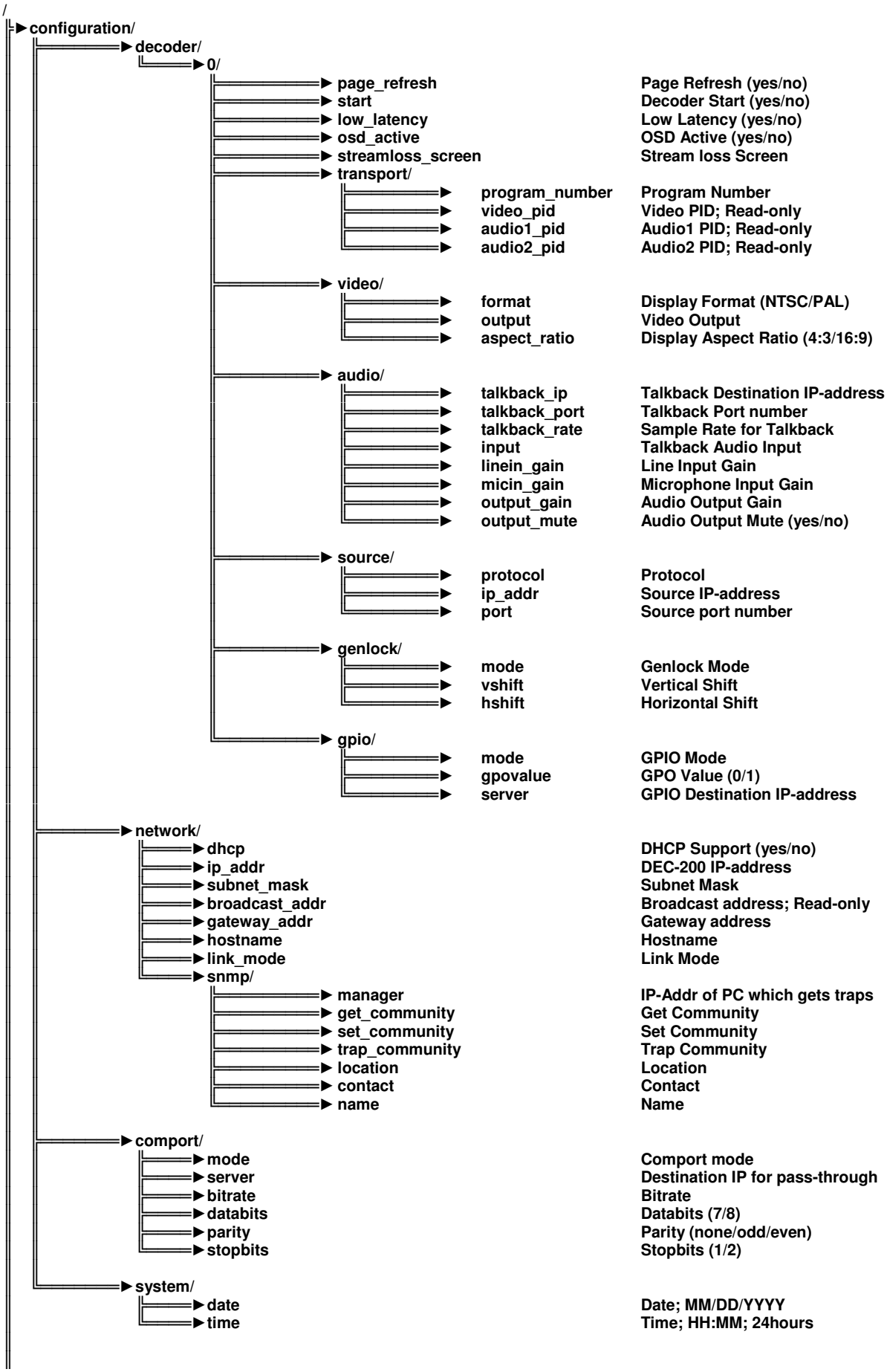
The command 'help' will display a list of all available options.

The 'ls' command allows you to see the available directories and options in the current directory.
To change the current directory, write 'cd directory_name', e.g. 'cd status'. To go one directory layer upstairs, enter the command 'cd ..'. If you enter the command 'exit', the telnet session will close.

If you want to enter the value of an option you must use the 'put' command followed by the correct values. Afterwards use the 'apply' and 'save' commands to apply and/or save your changes.

.!. **Example:**
E.g. for changing the source IP-address, you need to type the following:
- put /configuration/decoder/0/source/ip_addr 239.252.20.100
- apply /configuration/decoder/0/source/ip_addr
- save

.!. **Figure 32 provides an overview over the telnet navigational and directory structure to test the remote control. This overview is useful to find the correct configuration settings when navigating in telnet mode. For instructions and descriptions on the individual settings, please see the corresponding chapters for web based configuration.**


/
configuration/
decoder/
0/
page_refresh — Page Refresh (yes/no)
start — Decoder Start (yes/no)
low_latency — Low Latency (yes/no)
osd_active — OSD Active (yes/no)
streamloss_screen — Stream loss Screen
transport/
program_number — Program Number
video_pid — Video PID; Read-only
audio1_pid — Audio1 PID; Read-only
audio2_pid — Audio2 PID; Read-only
video/
format — Display Format (NTSC/PAL)
output — Video Output
aspect_ratio — Display Aspect Ratio (4:3/16:9)
audio/
talkback_ip — Talkback Destination IP-address
talkback_port — Talkback Port number
talkback_rate — Sample Rate for Talkback
input — Talkback Audio Input
linein_gain — Line Input Gain
micin_gain — Microphone Input Gain
output_gain — Audio Output Gain
output_mute — Audio Output Mute (yes/no)
source/
protocol — Protocol
ip_addr — Source IP-address
port — Source port number
genlock/
mode — Genlock Mode
vshift — Vertical Shift
hshift — Horizontal Shift
gpio/
mode — GPIO Mode
gpovalue — GPO Value (0/1)
server — GPIO Destination IP-address
network/
dhcp — DHCP Support (yes/no)
ip_addr — DEC-200 IP-address
subnet_mask — Subnet Mask
broadcast_addr — Broadcast address; Read-only
gateway_addr — Gateway address
hostname — Hostname
link_mode — Link Mode
snmp/
manager — IP-Addr of PC which gets traps
get_community — Get Community
set_community — Set Community
trap_community — Trap Community
location — Location
contact — Contact
name — Name
comport/
mode — Comport mode
server — Destination IP for pass-through
bitrate — Bitrate
databits — Databits (7/8)
parity — Parity (none/odd/even)
stopbits — Stopbits (1/2)
system/
date — Date; MM/DD/YYYY
time — Time; HH:MM; 24hours

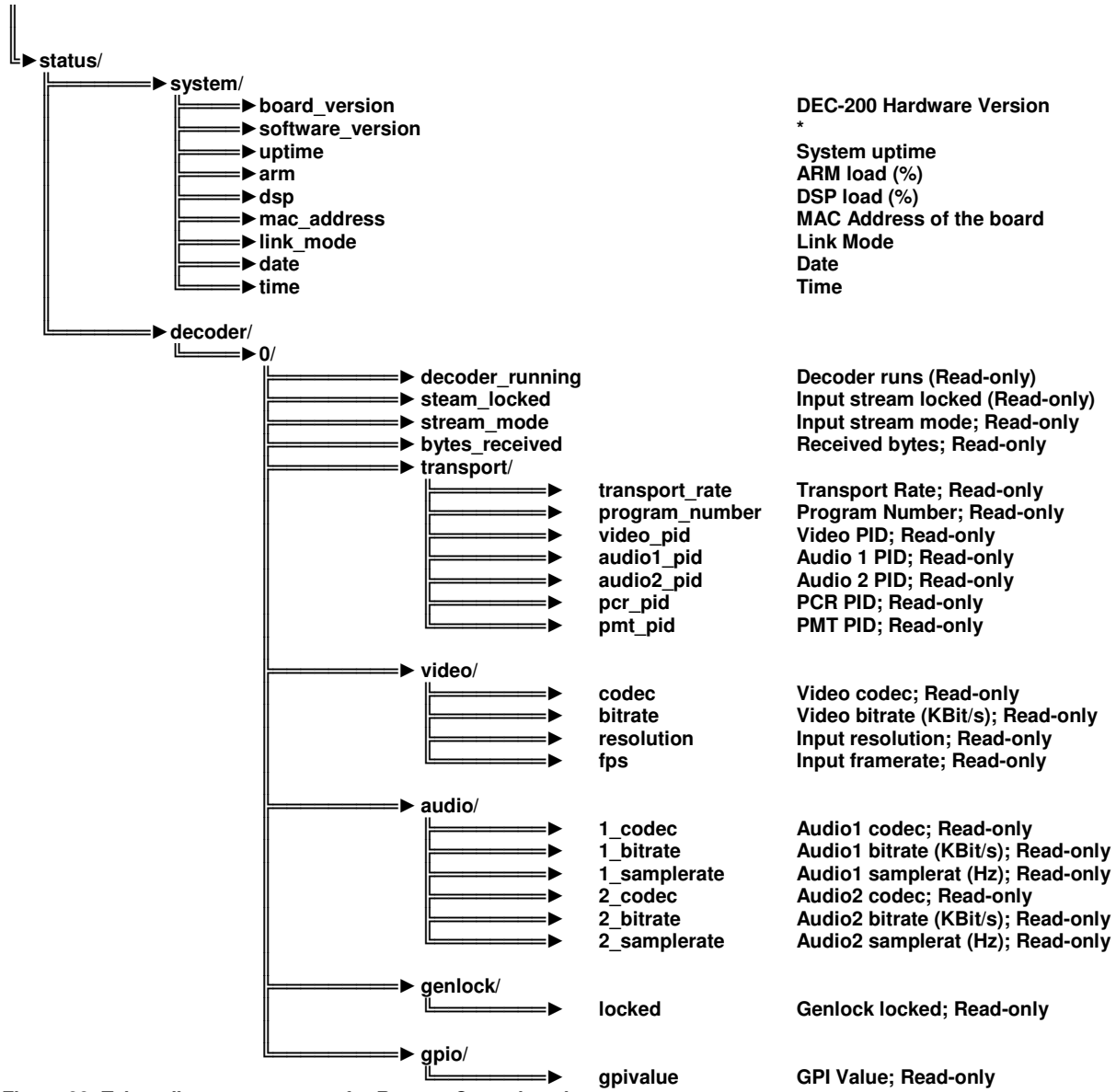


Figure 32: Telnet directory structure for Remote Control testing

* = is not supported at the moment

4.2 Audio Talkback

The audio input on the DEC-200™ operates as an audio encoder. It enables operating the DEC-200™ in Full Duplex Audio. The DEC-200™ in connection with the ENC-100™ or ENC-200™ can therefore be used for audio conferencing environments, where viewers of the encoded live streams are to be able to ask questions and communicate with people on the encoding side. The default talkback port number of the DEC-200™ is 9177.

For Example:
An encoder can be set up to encode video and audio from a camera that is installed at an entrance (security application). The person who wants to enter speaks into a microphone to state his/her name, etc. The microphone is connected to the audio input of the encoder. By using the decoder's audio input a receptionist/security officer is able to talk back to the person, e.g. arguing why access is denied or that the person should hold its ID into the camera. This represents regular two-way communication (Full Duplex Mode).

Another Example:
Students from classrooms or large auditoriums are communicating with doctors or surgeons inside of operation rooms or other sealed environments. With the DEC-200's talkback option students or monitoring staff are able to ask on the spot questions and communicate and learn in real-time.

4.2.1 Talkback Session between DEC-200™ and ENC-200™

To use the talkback function on the DEC-200™ in connection with the ENC-200™, please be sure that your encoder has the firmware version 0.9.20 or higher, because this firmware is necessary. If your ENC-200™ does not have the firmware version 0.9.20 or higher, please contact support@teracue.com.

In order to talkback from the DEC-200™ to the ENC-200™, please be sure that you have a microphone or another audio signal connected to the 'Audio In' input of your DEC-200™. Take also care that loudspeakers are connected in the 'Audio Out' output of the ENC-200™ on which you want talkback. See Figure 33. Figure 34 shows the talkback connection between DEC-200™ and ENC-200™ in Full Duplex Mode.

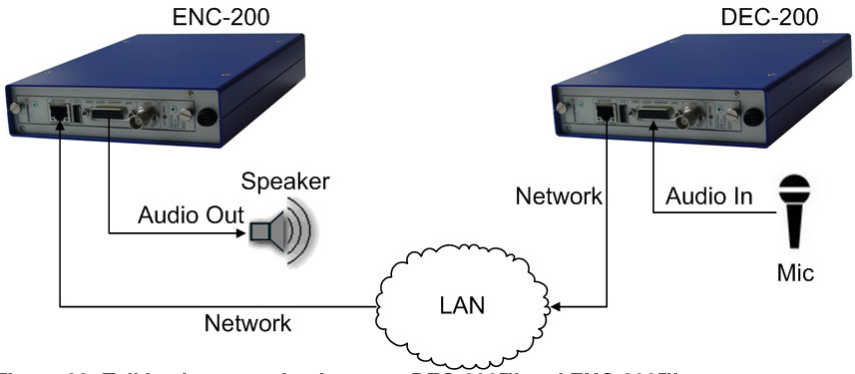


Figure 33: Talkback connection between DEC-200™ and ENC-200™

For a talkback session you must configure the DEC-200™ decoder and the ENC-200™ encoder.
To start the talkback session you must configure the DEC-200™ webpage. Please open the DEC-200™ webpage, select in the main menu ‘DECODER’ and click in the submenu ‘AUDIO’. See Figure 9 on page 21.

Enter in the ‘Talkback IP’ field the IP-address of the encoder with which the DEC-200™ should start the talkback session. For example: A DEC-200™ should start a talkback session with an ENC-200™. The encoder has the IP-address 172.16.20.100. So you must enter in the ‘Talkback IP’ field of the DEC-200™ webpage the IP-address of the encoder, in this case 172.16.20.100.

Next, the talkback port number must be entered in the ‘Talkback Port’ field. The decoder and the encoder must always have the same talkback port number. So please enter in the ‘Talkback Port’ field of the DEC-200™ your desired port number for the talkback session. This talkback port number must also be set in the ENC-200™ webpage.

Now, you must select in the field ‘Talkback Rate’ your desired sample rate, which should be used from the decoder. The decoder and the encoder must always use the same sample rate. So, the set talkback rate must also be set in the ENC-200™ webpage.

Furthermore, please select in the drop-down-field ‘Audio Input’ the corresponding audio input for the talkback function. If you supply the DEC-200™ with the audio signal from a microphone, you must select in the drop-down-field ‘Audio Input’ the parameter ‘MIC’. If you supply the DEC-200™ with a line level signal (e. g.: the audio signal from a DVD-Player), you must select in the drop-down-field ‘Audio Input’ the parameter ‘LINE’.

You can also set the gain in the fields ‘LineIn Gain’ and ‘MicIn Gain’ for the corresponding audio input, which you have set in the 'Audio Input' drop-down-field.

The DEC-200™ is totally configured for a talkback session now. As next you must configure the ENC-200™ webpage. Therefor please open the ENC-200™ webpage, select in the main menu ‘ENCODER’ and click in the submenu ‘AUDIO’. Here you must enter the talkback port number in the ‘Talkback Port’ field. The port number which you enter must be the same port number which you have entered on the decoder side. Furthermore you must select in the field ‘Talkback Rate’ the sample rate, which you have entered on the decoder side. You can also set the output gain level in the ‘Output Gain’ field and you can mute the audio of the talkback session by enabling the ‘Output Mute’ check-box.

Now, the DEC-200™ and your desired ENC-200™ is completely configured and you can talkback to your desired ENC-200™. To stop the talkback session, please enter ‘0.0.0.0’ in the ‘Talkback IP’ field of the DEC-200™.

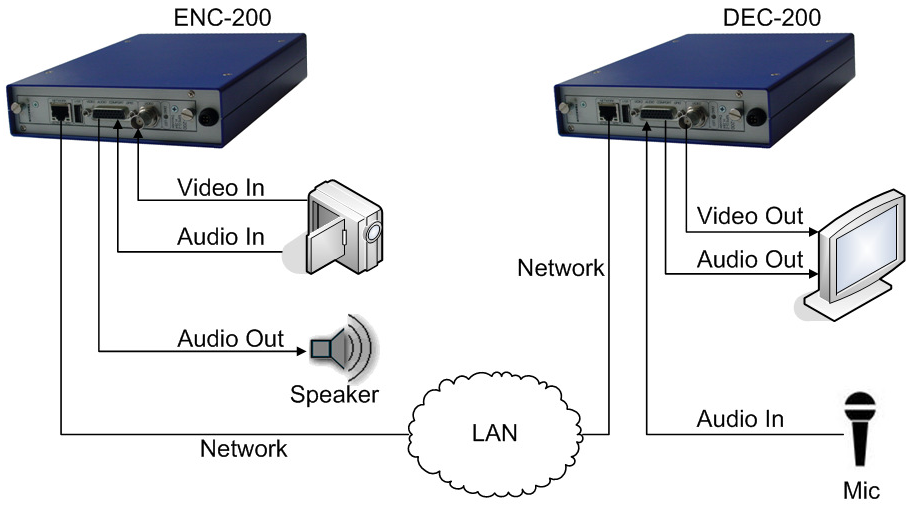


Figure 34: Talkback connection between DEC-200™ and ENC-200™ in Full Duplex Mode

4.2.2 Talkback Session between DEC-200™ and ENC-100™

To use the talkback function on the DEC-200™ in connection with the ENC-100™, please be sure that your encoder has the firmware version 3.12, because this firmware is necessary. If your ENC-100™ does not have the firmware version 3.12, please contact support@teracue.com.

In order to talkback from the DEC-200™ to the ENC-100™, please be sure that you have a microphone or another audio signal connected to the 'Audio In' input of your DEC-200™. Take also care that loudspeakers are connected in the 'Audio Out' output of the ENC-100™ on which you want talkback. See Figure 35. Figure 36 shows the talkback connection between DEC-200™ and ENC-100™ in Full Duplex Mode.

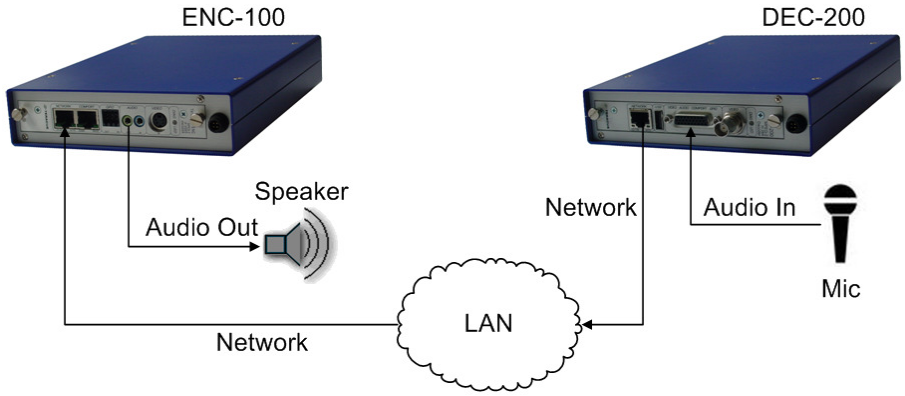


Figure 35: Talkback connection between DEC-200™ and ENC-100™

To start the talkback session you must configure the DEC-200™ webpage. Please open the DEC-200™ webpage, select in the main menu 'DECODER' and click in the submenu 'AUDIO'. See Figure 9 on page 21.

Enter in the 'Talkback IP' field the IP-address of the encoder with which the DEC-200™ should start the talkback session. For example: A DEC-200™ should start a talkback session with an ENC-100™. The encoder has the IP-address 172.16.20.100. So you must enter in the 'Talkback IP' field of the DEC-200™ webpage the IP-address of the encoder, in this case 172.16.20.100.

Next, the talkback port number must be entered in the 'Talkback Port' field. The decoder and the encoder must always have the same talkback port number. For a talkback session the ENC-100™ listens always on port 9177 and this port number can not be changed at the encoder side. So please enter in the 'Talkback Port' field of the DEC-200™ the port number 9177.

Now, you must select in the field 'Talkback Rate' your desired sample rate, which should be used from the decoder. The decoder and the encoder must always use the same sample rate. So, the set talkback rate must also be set in the ENC-100™ webpage. At the encoder side it can be chosen between 22.05 kHz and 48 kHz.

Furthermore, please select in the drop-down-field 'Audio Input' the corresponding audio input for the talkback function. If you supply the DEC-200™ with the audio signal from a microphone, you must select in the drop-down-field 'Audio Input' the parameter 'MIC'. If you supply the DEC-200™ with a line level signal (e. g.: the audio signal from a DVD-Player), you must select in the drop-down-field 'Audio Input' the parameter 'LINE'.

You can also set the gain in the fields 'LineIn Gain' and 'MicIn Gain' for the corresponding audio input, which you have set in the 'Audio Input' drop-down-field.

At the ENC-100™ encoder side, for the talkback function you must configure in the 'Talkback' field the sample rate, which you have entered on the decoder side. Furthermore you can also set the output gain level in the 'LineOut' field and you can mute the audio of the talkback session by enabling the 'mute' check-box.

Now, you can talkback to your desired ENC-100™. To stop the talkback session, please enter '0.0.0.0' in the 'Talkback IP' field of the DEC-200™.

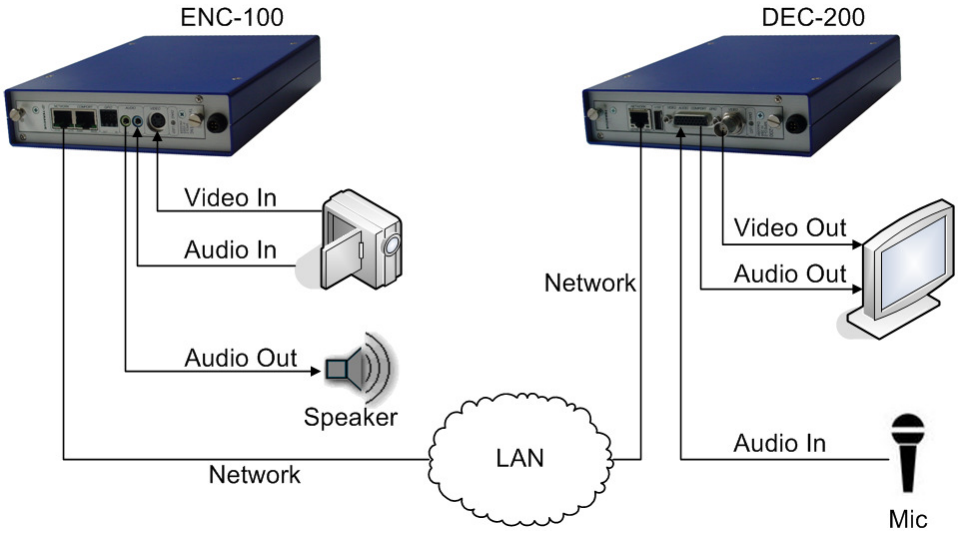


Figure 36: Talkback connection between DEC-200™ and ENC-100™ in Full Duplex Mode

4.3 TCP Streaming

If in your network occurs packet loss, jitter etc., we recommend using the connection-oriented protocol TCP. TCP provides a point-to-point connection (unicast) for applications that require reliable communications. If the TCP connection is established, then the data will be streamed in the same order as it was sent from the encoder. Furthermore, lost packets can be retransmitted via TCP.

The ENC-200™ supports TCP streaming in connection with the DEC-200™. To use TCP streaming on the ENC-200™ in connection with the DEC-200™, please be sure that your encoder has the firmware version 0.9.29 or higher and your decoder has the firmware version 1.39 or higher, because these firmware versions are necessary for TCP streaming.

TCP streaming is based on the client/server architecture. For TCP streaming with the ENC-200™ to DEC-200™ it exists to possibilities:

- For TCP streaming you can configure the ENC-200™ as a server and the DEC-200™ as a client.
- For TCP streaming you can configure the ENC-200™ as a client and the DEC-200™ as a server.

The ENC-200™ and DEC-200™ configuration changes depending on which client/server possibility do you choose. So, the following subchapters describe the ENC-200™ and DEC-200™ configuration for the two possibilities to make a TCP connection.

4.3.1 TCP configuration when ENC-200™ is the Server

Please make the following steps, to create a TCP connection at which the ENC-200™ is the server:

- Please open the **ENC-200™** webpage, go to the **ENCODER > SETTINGS** webpage and select in the **'Transport Protocol'** drop-down field the variable **'TCP/SERVER'**.

- Go to the **ENCODER > DESTINATION** webpage of the ENC-200™ and enter a value in the **'Sendbuffer Size'** field (e.g. 250000). The 'Sendbuffer Size' specifies how much TCP data are maximal stored at the sender side (at the encoder side). The higher the value, the more network problems can be absorbed, but the higher is the delay at the decoder in error case. After an error case, the delay decreases again. The delay increases only, if an error occurs in the network. That means: If no network problems occur, the delay does not increase, even though a high value is set in the 'Sendbuffer Size' field.

- Remain at the **ENCODER > DESTINATION** webpage of the ENC-200™ and enter in **'Port'** field a port number which is not used in the network and which is not blocked (e. g. 1234).

- Please open the **DEC-200™** webpage, go to the **DECODER > SOURCE** webpage and select in the **'Transport Protocol'** drop-down field the variable **'TCP/CLIENT'**.

- At the **DECODER > SOURCE** webpage of the DEC-200™, please enter in the **'IP address'** field the IP-address of the ENC-200™ (e. g. 172.16.20.100). Note: TCP supports only unicast.

- Remain at the **DECODER > SOURCE** webpage of the DEC-200™ and enter in the **'Port number'** field the same port number, which you have entered in the ENC-200™ (e.g. 1234).

Now the ENC-200™ and the DEC-200™ are configured for a TCP-connection.

4.3.2 TCP configuration when DEC-200™ is the Server

Please make the following steps, to create a TCP connection at which the DEC-200™ is the server:

- Please open the **ENC-200™** webpage, go to the **ENCODER > SETTINGS** webpage and select in the **'Transport Protocol'** drop-down field the variable **'TCP/CLIENT'**.
- Go to the **ENCODER > DESTINATION** webpage of the ENC-200™ and enter in the **'IP address'** field the IP-address of the DEC-200™ (e. g. 172.16.20.200). Note: TCP supports only unicast.
- At the **ENCODER > DESTINATION** webpage of the ENC-200™, please enter in **'Port'** field a port number, which is not used in the network and which is not blocked (e. g. 1234).
- Remain at the **ENCODER > DESTINATION** webpage of the ENC-200™ and enter a value in the **'Sendbuffer Size'** field (e.g. 250000). The 'Sendbuffer Size' specifies how much TCP data are maximal stored at the sender side (at the encoder side). The higher the value, the more network problems can be absorbed, but the higher is the delay at the decoder in error case. After an error case, the delay decreases again. The delay increases only, if an error occurs in the network. That means: If no network problems occur, the delay does not increase, even though a high value is set in the 'Sendbuffer Size' field.
- Please open the **DEC-200™** webpage, go to the **DECODER > SOURCE** webpage and select in the **'Transport Protocol'** drop-down field the variable **'TCP/SERVER'**.
- Remain at the **DECODER > SOURCE** webpage of the DEC-200™ and enter in the **'Port number'** field the same port number, which you have entered in the ENC-200™ (e.g. 1234).

Now the ENC-200™ and the DEC-200™ are configured for a TCP-connection.

4.4 Resetting to Factory Default

The DEC-200™ can easily be returned to its factory default values. In order to do these please power down the decoder chassis and remove the blue top cover of the chassis. The Factory-Reset feature is available as from the DEC-200™ firmware version 0.1.18. All lower DEC-200™ firmware versions do not support the Factory-Reset feature (In this case: Please note chapter 9).

Please execute the following steps to reset the DEC-200™ to the factory default settings:

- Hold the opened chassis with the video input pointing to the left.
- Locate the black pin connector and the jumper which is placed on the middle pin pair of the black pin field.
- Place the jumper now on the left pair of the black pins, see Figure 37 and Figure 38
- Turn the power on.
- Wait for 2 minutes.
- Power down the chassis. Return the jumper to its original position, i.e. onto the middle pin pair of the black pin field.
- Close the chassis with the blue top cover, connect the network cable and all audio/video cables and turn the power on. All configuration settings except the network settings of your decoder have been returned to its factory defaults.
- To activate the returned network settings, please reboot your DEC-200™. After the reboot the network settings of your DEC-200™ is also returned. Your DEC-200™ is now available on the default IP-address 172.16.20.200.

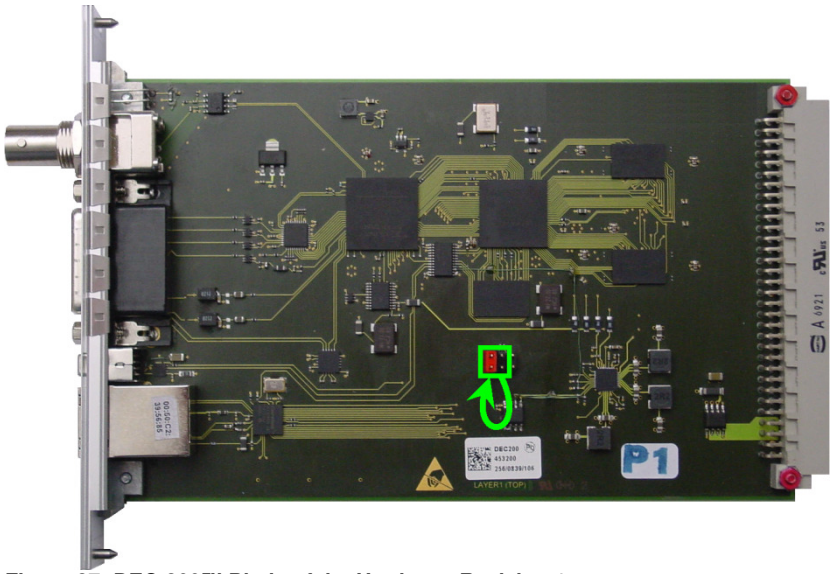


Figure 37: DEC-200™ Blade of the Hardware Revision 1

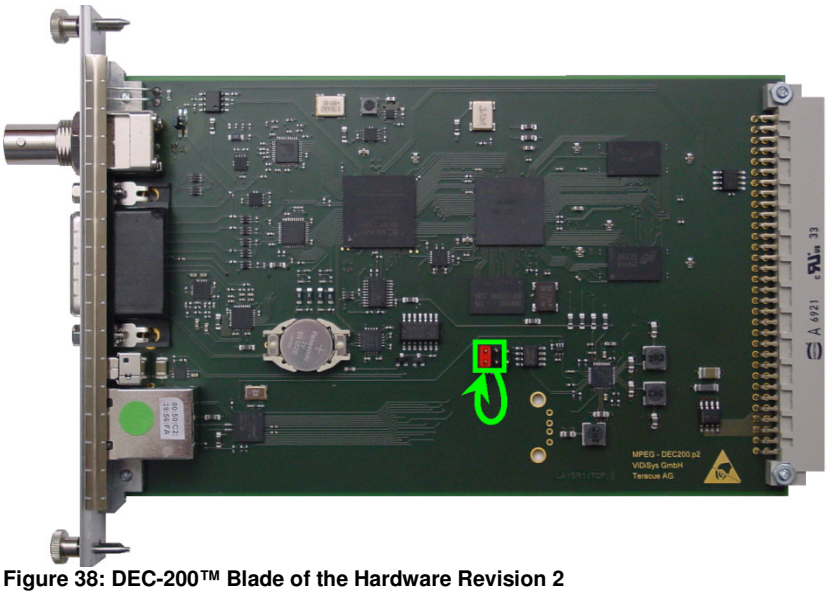


Figure 38: DEC-200™ Blade of the Hardware Revision 2

4.5 Output Signal Switching of the BNC Connector on the Front Panel

You have the possibility to change the signal type (Composite or SDI) for the video output at the BNC connector on the front panel. The COMP/SDI switching feature at the BNC connector on the front panel is only available for DEC-200™ Hardware Revision 2 blades. Furthermore this feature is implemented since the DEC-200™ firmware version 1.29.10.

To switch the signal type (Composite or SDI) for the video output at the BNC connector on the front panel, you must put a mini-jumper to another pin position. Furthermore for Composite output you must change the video signal output parameter on the DEC-200™ webpage, please see chapter 3.4.3 on page 20. If you want to have a SDI output on the BNC connector, you must only put the mini-jumper on the right position without changing any setting in the DEC-200™ webpage.

If you hold the decoder with the video output pointing to the left, you can locate the mini-jumper at the top left corner of the blade, see Figure 39.

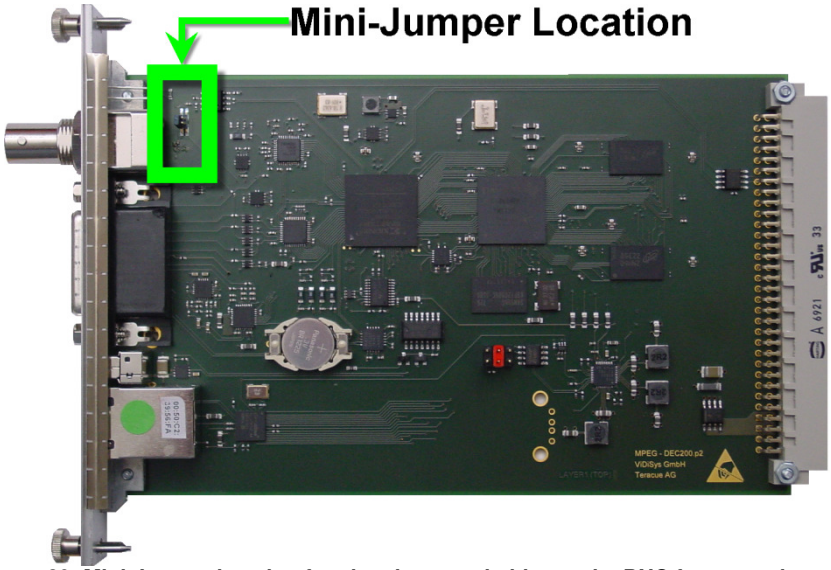


Figure 39: Mini-Jumper location for signal type switching at the BNC front panel output

For SDI out at the BNC connector on the front panel:
If you need a SDI signal at the BNC connector of the front panel, please place the mini-jumper in the vertical direction of the left mini-pin pairs, based on the fact that the DEC-200™ pointing with the video output to the left, see Figure 40. For SDI output you must only put the mini-jumper on the described position without changing any setting in the DEC-200™ webpage.

For Composite out at the BNC connector on the front panel:
If you need a COMP signal at the BNC connector of the front panel, please place the mini-jumper in the horizontal direction of the lower mini-pin pairs, based on the fact that the DEC-200™ pointing with the video output to the left, see Figure 41. For Composite output you must also change the video signal output parameter on the DEC-200™ webpage, please see chapter 3.4.3 on page 20.

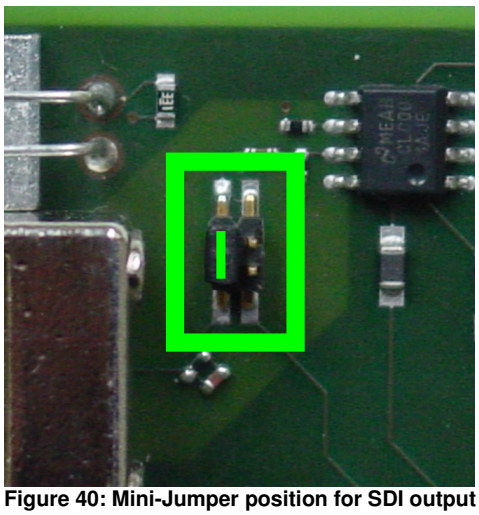


Figure 40: Mini-Jumper position for SDI output

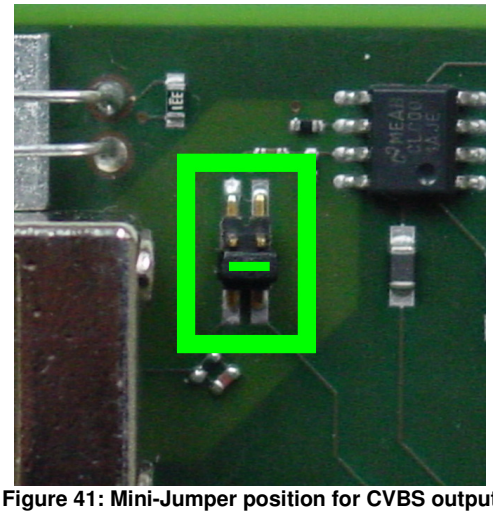


Figure 41: Mini-Jumper position for CVBS output

4.6 Restarting the DEC-200™

If a DEC-200™ is not approachable anymore, you can restart the DEC-200™ by using the restart switch. The restart button is placed in a hole on the front panel and it is located into the 'O' of the lettering 'NETWORK', see Figure 42. To press the restart button, you need a long thin object with which you can put it through the hole and with which you can press the restart button. After you have pressed the button, the DEC-200™ restarts. The restart button on the front panel is only available at DEC-200™ Hardware Revision 2 blades.

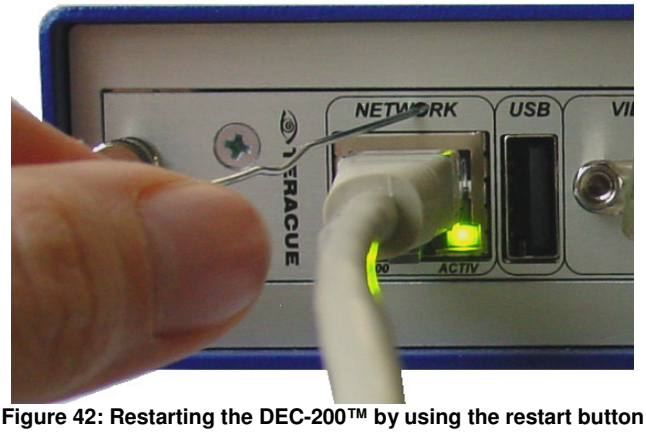


Figure 42: Restarting the DEC-200™ by using the restart button

5. CE conformance

The DEC-200™ is labeled with the CE seal.
The DEC-200™ is in conformity with the following standards:

EN 55103-1	Electromagnetic Interference - Product Family Standard for Audio, Video, Audio-Visual and Entertainment Lighting Control Apparatus for Professional use - Part 1: Emissions
EN 55103-2	Electromagnetic Susceptibility - Product Family Standard for Audio, Video, Audio-Visual and Entertainment Lighting Control Apparatus for Professional use - Part 2: Immunity
EN 55022	Limits and Methods of Measurement of Radio Interference Characteristics of Information Technology Equipment

6. Restriction of Hazardous Substances Directive (RoHS)

The DEC-200™ is manufactured according to the RoHS Directive. The Directive on the Restriction of Hazardous Substances in Electrical and Electronic Equipment (RoHS) has been passed as a law by the European Union. It affects manufacturers, sellers, distributors and recyclers of electrical and electronic equipment containing hazardous substances as lead, cadmium, mercury, hexavalent chrome, polybrominated biphenyl (PBB) and polybrominated diphenyl ether (PBDE).

After July 1, 2006 the use of these materials will be banned in new products sold in Europe.
Since beginning of 2005, Teracue began the process of redesigning and converting all of its products to not contain any of the listed materials. All new products sold by Teracue will be fully RoHS-compliant by July 1, 2006.

7. Waste Electrical and Electronic Equipment Directive (WEEE)

The WEEE Directive has been passed to reduce waste arising from electrical and electronic equipment. It encourages reuse, recycling and other forms of recovery. Customers and end-users of electronic equipment in the EU can therefore play an important role in reducing WEEE and saving the environment by separating out WEEE and disposing of it properly.

Teracu is a registered WEEE participant since 2004. Within Germany, Teracue is registered under the WEEE Number: DE10642708. German customers and end-users are required to discard products marked with the WEEE symbol (crossed out trash bin) at local resource collection points. Do not dispose products marked with the WEEE symbol in domestic refuse.

Every country within the EU has defined different directives and methods for the collection of electronic materials to ensure the WEEE Directive. Please follow the national guidelines that have been identified for your country. For more information about waste disposal of your old electrical and electronic equipment, please contact your local city office, your waste disposal service or the company where you bought the product.

8. Technical Specification

DEC-200™:

DEC-200™:	H.264 SD and MPEG-2 SD decoder blade with analogue video output and SDI output, embedded audio supported. The BNC connector on the front panel can be configured as Composite- or as SDI-output via jumper. The DEC-200™ is delivered with the BREAK-OUT cable S as standard. Teracue also offers a professional BREAK-OUT cable P which must be ordered separately. S – YC (MiniDIN), CVBS (RCA), Analogue Audio In (MiniJack), Analogue Audio Out (RCA) P – RGB, Sync, YPBPR, YC, CVBS, Genlock, AES-3id (BNC), Audio Out/In (RCA), GPI In/Out (Sub-D 9pin), RS-232 (Sub-D 9pin)

Decoding Specifications:

Standards:	PAL, NTSC
Video Outputs:	Composite: 1 VPP, 75 Ohm; Or SDI Output: 0,8 VPP, 75 Ohm (embedded audio support); This can be configured via jumper.
Break-out cable outputs:	Composite: 1 VPP, 75 Ohm S-Video: 1 VPP (Y), 0,3 VPP (C - Pal), 0,286 VPP (C - NTSC), 75 Ohm Component: 1 VPP (Y), 0,7 VPP (PBPR) , 75 Ohm RGB: 0,7 VPP, 75 Ohm, Sync: 0,3 VPP Genlock: Blackburst 0,3 VPP, 75 Ohm
Video Output Resolutions:	Full D1: 720h x 480/576v, Half-D1: 352h x 480/576v, CIF/SIF: 360/384h x 288/240v, QCIF: 176h x 144/120v
Audio Outputs:	Unbalanced Analog Stereo, Consumer Line level AES-3id, 75 Ohm, 1 VPP, Unbalanced
Audio Inputs (Talkback):	Analog Stereo, Consumer Line level
Video Codecs:	MPEG-2 (ISO/IEC 13818-2), Main Profile at Main Level (MP@ML), 4:2:0 MPEG-4 AVC/H.264 (ISO/IEC 14496-10), Main Profile at Level 3.1 (MP@L3), Baseline Profile at Level 3.1 (BP@L3), 4:2.0
Stream types:	ISO/IEC 13818-1 Transport Streams Elementary A/V
Audio Codecs:	MPEG-1 Audio Layer 1, 2 (ISO/IEC 11172-3 Layer 1, 2) MPEG-4 AAC LC (ISO/IEC 14496-3)

I/O Specifications:

Network:	10/100TX Ethernet, RJ45, half/full duplex, Auto-sensing
Streaming traffic:	Unicast and Multicast traffic supported
IP Protocols:	HTTP (Web Browser), TCP/IP Control Protocol, UDP/IP Streaming, IGMPv2/3, SNMP, RTP*, RTCP*, RTSP*, DHCP
RS-232 port:	RS-232 connection via console (Remote control for non IP devices via TCP/IP RS-232 command tunnelling*)
GPI in*:	1 INPUT, (for device control: Streaming on/off configuration*)
GPI out:	1 OUTPUT, for switching peripheral devices on/off

Environmental:

Agency Approvals:	CE, RoHS compliant
Humidity:	Up to 90%, non-condensing
Temperature:	0 to +60°C environment temperature; fan less when operated in FR-110 or FR-210 frames
Weight:	Approx. 160 grams
Blade dimensions (H/W/D):	20mm x 130mm x 190mm
Power:	5W per blade

Limited Warranty:	1 year standard limited warranty. Warranty extensions available

Chassis:

FR-110:	Single channel chassis, 5V DC, 10W, 100-240V AC ext. power supply included; Dimension (H/W/D): 45mm x 145mm x 240mm, Weight: 650 grams; No forced cooling required (fan less)
FR-210:	Dual channel chassis, 5V DC, 10W, 100-240V AC ext. power supply included; Dimension (H/W/D): 70mm x 145mm x 240mm, Weight: 650 grams; No forced cooling required (fan less)
FR-610:	Multichannel chassis with cooling fans; holds max. 6 ENC/DEC blades; Two redundant power supply modules: Max. 70W with 6 blades, 100-240V AC; Dimension (H/W/D): 45(1RU) x 485 x 395 mm, Weight: 4,35 kg (empty)
FR-2000-24:	High-density, multichannel chassis; holds max. 21 ENC/DEC blades, Max. 150W with 21 blades, 90-240V AC internal DUAL, REDUNDANT power supply with cooling fan. Dimension (H/W/D): 176(4RU) x 480 x 400 mm, Weight: 9,5 kg (empty)
FR-PLATE-1/3:	FR-2000-24 / FR-610 covering plate for empty slots: 'FR-PLATE-1' covers 1 slot; 'FR-PLATE-3' covers 3 slots.

9. Known Issues

- The DEC-200™ firmware versions till version 0.1.17 do not support the 'Factory-Reset' feature. So if your DEC-200™ has a lower firmware version than 0.1.18 and if you change the IP-address of your decoder, please make a note of the new decoder IP-address and save this note.

- Concerning all firmware versions from 0.1.8 till 0.1.16: For unicast reception you must enter in the 'IP address' field of the 'DECODER/SOURCE' webpage the IP-address of the DEC-200™, e. g. 172.16.20.200. See Figure 43.

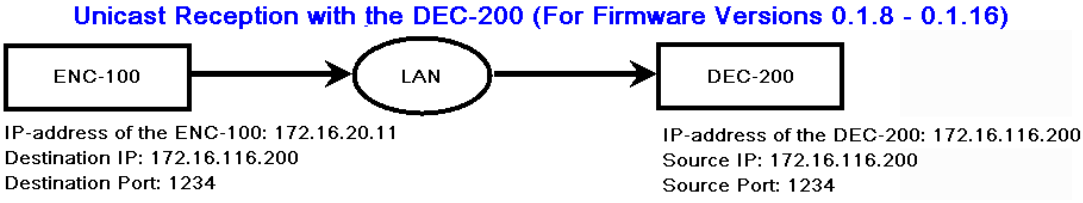


Figure 43: Unicast Reception (For Firmware Versions 0.1.8 - 0.1.16)

- All DEC-200™ firmware versions since version 0.1.19 are for the DEC-200™ Hardware Revision 2. If a DEC-200™ Hardware Revision 1 will be updated with a firmware version 0.1.19 or higher, the DEC-200™ Hardware Revision 1 supports still only the features till firmware version 0.1.18.

- If the DEC-200™ is set to DHCP, a downgrade to a lower DEC-200™ Firmware than 0.1.24 may not made, because in this case no network address will be assigned.

- A range of DEC-200™ decoders have the +3.3 V at Pin 24 which is protected with a 1k resistor. The listed serial numbers below specifies the DEC-200™ decoders with this resistor. At these decoders, the +3.3 V can not be used as a supply voltage. At all other DEC-200™ decoders, which are not listed here, the auxiliary supply can be used as a fused supply voltage with max. 500mA current.

  S/N: 00:50:C2:39:71 - 00:50:C2:39:7E
  S/N: 256/0839/100 - 256/0839/157
  S/N: 256/0839/159 - 256/0839/180
  S/N: 256/0839/185 - 256/0839/194
  S/N: 2MK/0912/251 - 2MK/0912/287
  S/N: 2MK/0921/301 - 2MK/0921/314
  S/N: 2MK/0921/316 - 2MK/0921/356
  S/N: 2MK/0921/449
  S/N: 2MK/0921/451 - 2MK/0921/459
  S/N: 2MK/0921/461

- The DEC-200™ firmware version 1.30 or higher does support not anymore the DEC-200™ Hardware Revision 1. So, if you have a DEC-200™ Hardware Revision 1 blade, it is very important that you do not update your DEC-200™ with the firmware version 1.30 or higher.

IV. List of figures

V. List of tables