OPTICODEC

7200 / 7400 / PC Remote

Handbuch

orban

OPTICODEC

Manual

7200/7400

Software V4.25/2007

PC REMOTE

Software V1.24/2007

orban

Table of Contents

The "ISO-MPEG Audio Layer 2 and Layer 3" compression procedures developed by the Fraunhofer Institute and the Institut für Rundfunktechnik allow audio signals (even large amounts of data) to be reduced in real time and transferred without any subjective loss of quality. The digitised signals received in this form are compressed (encoded) to save on transmission bandwidth, time and cost.

CODEC is a word coined from the verbs "enCOde" and "DECode" and stands for a new data transfer technology via ISDN or satellite.

The principle of codec technology for audio data reduction is based on the frequency-dependent sensitivity of the human ear. According to its objective auditory properties and subjective hearing habits, the ear ignores certain sounds and concentrates on the most essential ones: the message. This contrasts with purely electronic techniques which hear everything, even the non-essential noise.

The codec technology takes advantage of the difference between the ear and electronic measuring device when transferring data. By masking all meaningless noise, even the minutest, a reduction ratio is achieved, which is necessary to transport large amounts of data in real time via ISDN, for example. The data is instantly decompressed and subjected to A/B comparison and then the ear at the other end of the line hears only what it is intended to hear – no more and no less.

Some typical examples of data reduction rates achieved with ISO-MPEG1 can be seen in the following table:

Algorithm	Bitrate (kbps)	Audio mode	Reductions ratio
in Layer 1	384	Stereo	1:4
in Layer 2	192...256	Stereo	1:6...1:8
in Layer 3	112...128	Stereo	1:10...1:12

VDE

The OPTICODEC units hereafter complies to the following regulations and standards:

EN 60950/VDE 0805/IEC 950: Protection Class 1.
VBG4, Part 5 paragraph 4: Regulations for the prevention of accidents "Electrical Systems and Materials".

EC directives: EMV 89/336/EWG and "low voltage regulation" 73/23/EWG.

FCC Rules, Part 68 Subpart D:
FCC/Part 68 registration number US: OBDYNAN42059.

Industry Canada
Industrie Canada

Industry Canada registration number IC: 4265A-001.

EMV

EMC directives:
DIN EN 55103-1 (June 97) - interference radiation, ambiance E1 and DIN EN 55103-2 (June 97) - resistance to jamming, ambiance E5, intensity degree 4 (ITU/R recommendation 500-4).

EN 50419:2005 Marking of Electrical and Electronic Equipment accordance with Directive 2002/96/EC (WEEE).

For recycling the OPTICODEC please refer to your responsible OPTICODEC distributor.

Note on EMC Measures

According to the requirements of the EMC directive, the regulations for electromagnetic compatibility, it is necessary that the following measures are observed when using/manufacturing the connection cables:

- For all connections shielded cables should be used (with respect to the audio cables the well-known EMT 211 has proven its worth).
- The shields should be soldered to the GND connections and additionally to the connector shell directly.
- For 3-pole audio sockets/plugs (type XLR) the respective counter sockets/plugs manufactured by NEUTRIK should be used.
- Pin 4 (housing) is to be connected to pin 1 ground.

Description

The OPTICODEC 7200 and 7400 are fully duplex audio codecs with ISDN and X.21 interfaces as a standard. The OPTICODEC 7400 is also equipped with an Ethernet 100Base-Tx interface for the remote control and distribution of audio data over networks such as Intranet, ATM etc. TCP for Point-to-Point connections, UDP for Broadcast and Multicast modes.

Ethernet/ISDN Cabling

Correct operation of the OPTICODEC is only guaranteed when using the delivered RJ45 Typ CAT5 cables.

ISDN Connection

Correct operation of the OPTICODEC is only ensured when the unit is connected to an approved Telecom access. When operating the unit on other telephone networks (private exchange), several adjustments are necessary. Please see chapter 'System Setup'. Adaptation to certain networks other than herewith specified can not be guaranteed.

Installation

The units are designed for installation into 19" racks. Installation with additional mounting rails is recommended because of the depth of the units. The OPTICODECs do not have internal fans and do not necessarily require additional ventilators even when built into racks. A minimum distance does not have to be kept within installed units.

Please note

This manual is for the use of OPTICODEC owners and their staff only. The information in the manual, including all texts and drawings, is to be treated as confidential and may not be passed on to third parties, reproduced, translated or multiplied in any form whatsoever. Hereby the right to register utility models or patent applications is reserved explicitly. In the case of violation or non-compliance resulting in consequential losses, ORBAN Europe GmbH may be entitled to claim damages according to the German BGB, HGB as well as Competition Law and Patents Act.

Comments

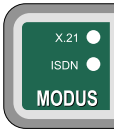
In this manual the simplified denotation 'OPTICODEC' refers to both units.

Explanation of Keypad Symbols

SYNC OK

Display of the decoder sync flag. If this LED lightens, the decoder receives correct data from the partner unit.

MODUS



X.21 Shows an X.21 connection.
ISDN Shows an ISDN connection.
For 'codec loop' none of the above displays are active.

STATUS
CLOCK ERROR

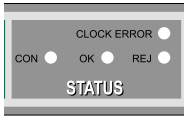
Only for an X.21 connection. Shows that there is either no clock at the X.21 connection or a clock with the wrong frequency.

CON

Only for ISDN connections. Shows that at least one B-channel is connected to the partner unit.

OK

For X.21: connection established.
For ISDN: ISDN connection synchronized.



The connection is fully established as soon as the Sync 'OK' LED lightens additionally.

REJ

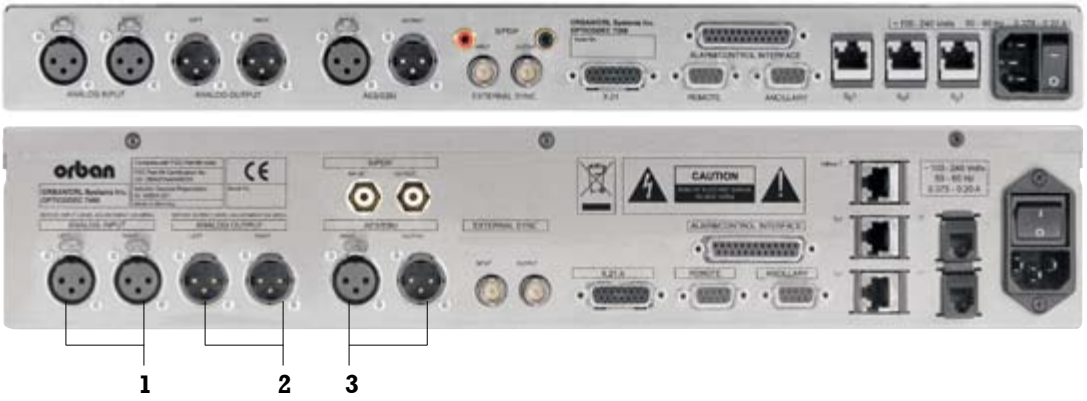
Only for ISDN: connection could not be established.

HANG UP

By pressing this key a connection can be disconnected. It has no function, if no connection had been established. If the key is pressed for the first time, the STANDBY LED flashes. The 'Hang Up' key has to be pressed again within 10 seconds to disconnect the line.

STANDBY

Shows that the unit can be called or can establish a connection itself.



(1) Audio input, symmetrical

Level: -4 dBu to.+21 dBu adjustable via 'System Setup' (+12 dBu preset)
Input Imped.: ≧10 kOhm (switchable over to 600 Ohm, jumper JP 800/801
Connector: XLR jack (female)

Pin	1	2	3
Assignment	GND	IN (+)	IN (-)

(2) Audio output, symmetrical

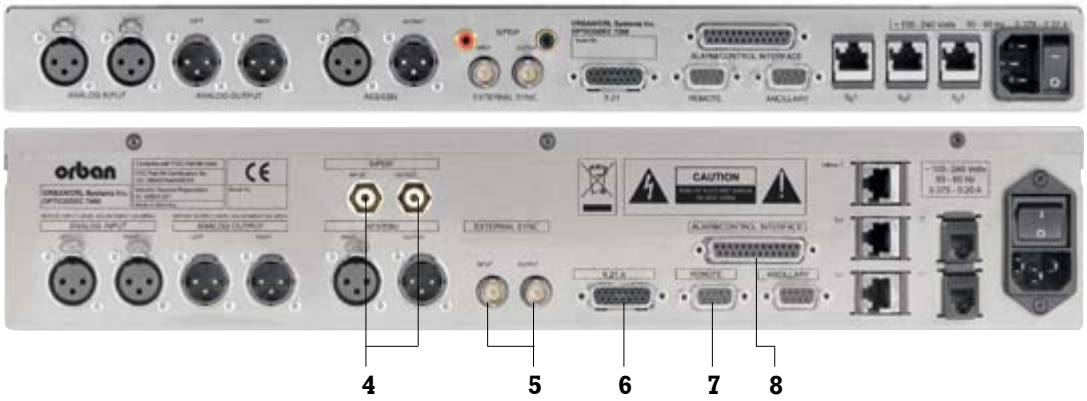
Level: -4 dBu to.+21 dBu adjustable via 'System Setup' (+12 dBu preset)
Output Imped.: ‹ 50 Ohm
Connector: XLR jack (male)

Pin	1	2	3
Assignment	GND	OUT (+)	OUT (-)

(3) Digital input/output (AES/EBU standard)

Level: according to IEC 958, prof. format
Connector: XLR jack (female/male)

Pin	1	2	3
Assignment	GND	IN/OUT (a)	IN/OUT (b)



(4) Digital Input/Output (S/PDIF standard)

Connector: RCA (female/female)

Pin	Center Pin	Ring
Assignment	IN	GND

(5) External synchronisation

adjustable via 'System Setup'
Connector: BNC jack (male/male)
Signal level: TTL

Pin	Center Pin	Ring
Assignment	IN	GND

(6) Serial Synchronous Connection (X.21)

for the transmission of coded audio data to an external data transmission unit, e.g. terminal adapter or satellite MODEM.
Transmission Rate: 8 to 384 kbps
Connector: 15-pole Sub-D

Pin	1	2	3	4	5
Assignment	NC	Tx (a)	CTR (a)	Rx (a)	IND (a)
Function*		**O**	**O**	**I**	**I**

Pin	6	7	8	9	10
Assignment	CLK (a)	NC	GND	Tx (b)	CTR (b)
Function*	**I**			**O**	**O**

Pin	11	12	13	14	15
Assignment	Rx	IND (b)	CLK (b)	NC	NC
Function*	**I**	**I**	**I**		

* related to OPTICODEC **O**=output **I**=input

(7) RS232/RS422 Serial Asynchronous Interface (Remote)

to control the OPTICODEC using an external PC (pls. see also chapter 'PC Connection', page 18).

Switch over from RS232 to RS422: Jumper J3 to 1+2 (pls. see also chapter 'Jumper Settings', page 23).

Format RS232/RS422: 9600 baud
8 data bits
1 stop bit
no parity

Connector: 9-pin Sub-D

Pin	1	2	3	4	5
Assignment	Tx+	RC_Tx	RC_Rx	Rx-	GND
RS232		■	■		■
RS422	■			■	■
Function*	**O**	**O**	**I**	**I**	

Pin	6	7	8	9
Assignment	Tx-	NC	NC	Rx+
RS232		■	■	
RS422	■			■
Function*	**O**	**I**	**O**	**I**

* related to OPTICODEC
■=not to be used! ■=assigned **O**=Output **I**=Input

Warning

For RS232 internal signals are assigned to pins 2, 3 and 5, for RS422 to pins 1, 4, 5, 6 and 9!
A fully assigned 1:1 cable to the PC might result in the damage of the PC and/or OPTICODEC!
Please use only cables as described above.

(8) Alarm/Control Interface

The switching commands of the OPTICODEC input are transmitted and made available as open collector signals at the partner unit. The inputs and outputs (same as GND connections 13, 25) are electrically isolated via an opto-electronic coupler.

Connector: 25-pin Sub-D

Pin	1	2	3	4	5
Assignment	NC	NC	NC	IN8	GND
Function*				Red-Light IN	

Pin	6	7	8	9	10
Assignment	IN7	IN6	IN5	IN4	IN3
Function*	Reset	(Index)	FF	Rew	Stop

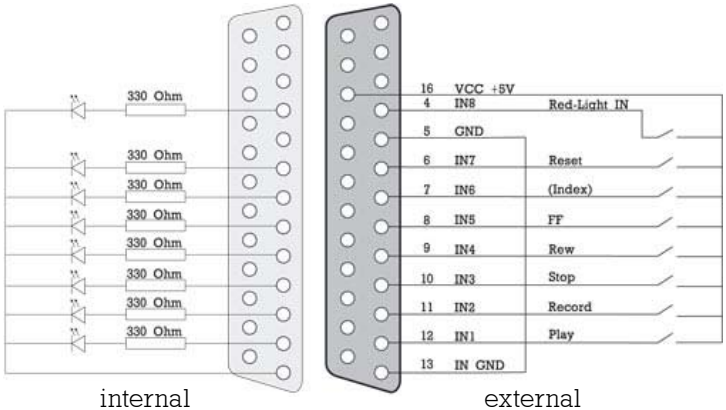
Pin	11	12	13	14	15
Assignment	IN2	IN1	IN GND	NC	NC
Function*	Record	Play	**		

Pin	16	17	18	19	20
Assignment	VCC	OUT8	OUT7	OUT6	OUT5
Function*	+5V	Red-Light	Reset	(Index)	FF
System Setup***			DIS	CON	

Pin	21	22	23	24	25
Assignment	OUT4	OUT3	OUT2	OUT1	O.GND
Function*	Rew	Stop	Record	Play	****

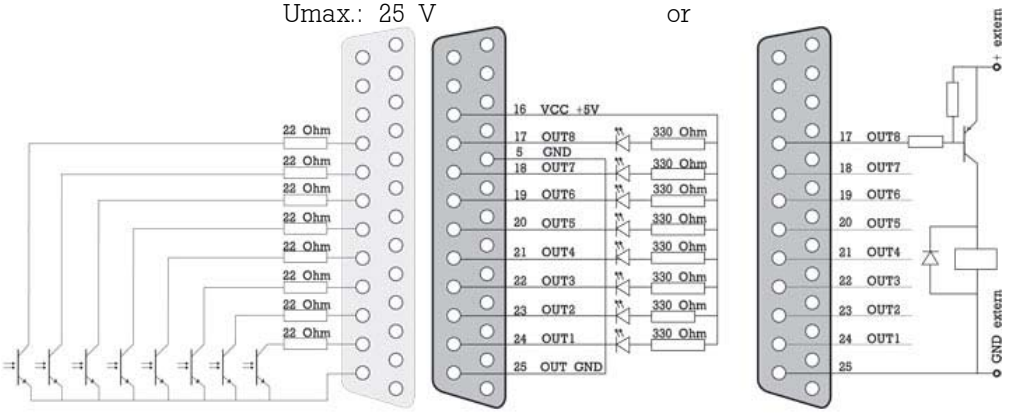
* related to OPTICODEC
** common earth for all inputs
*** pls. see 'Alarm Signals' (pages 44 and 73)
**** common earth for all outputs

Input Wiring Imax.: 10 mA



internal external

Output Wiring Imax.: 10 mA
Umax.: 25 V or



internal extrenal external

Please note The recommended functions of the inputs and outputs correspond to the way these are assigned by OPTICODEC users. These assignments should be taken over to avoid any problems in remote controlling externally connected units during transmissions between different OPTICODEC units.

Warning When manufacturing a connection cable for the interfaces Alarm Control Interface and Ancillary, the respective connector shells (width: ≤ 15 mm) have to be used:

* for e. g.: Farnell Electronic Components GmbH, D-82041 Deisenhofen
Fax: +49 / 89 613 5901
www.farnell.com

Type/Pole	Sub-D Shell	Order No*
9-pole	DTZK-9-K	463-012
25-pole	DTZK-25-K	463-036

(9) RS232/RS422 Serial Asynchronous Interface

to transmit user data via OPTICODEC.
Format: 0 ... 9600 baud (pls. see table)
8 data bits
1 stop bit
no parity

Table of implemented ancillary data starting from software V4.10

Data rate: (kbps)	8	16	24	32	48	56	≥64	≥128
Layer 2: (baud)	0	1200	1200	2400	2400	2400	4800	4800
Layer 3: (baud)	0	1200	1200	2400	2400	4800	4800	9600

Note

If the software version of one or both of the OPTICODECs is < V4.10, then a baud of 1200 is always utilised.
If the software version of both units ≥ V4.10, the OPTICODECs are automatically set to the lowest default ancillary data rate.

Connector: 9-pin Sub-D

Pin	1	2	3	4	5
Assignment	NC	R_Tx	R_Rx	NC	GND
Function*		**O**	**I**		

Pin	6	7	8	9	
Assignment	NC	RTS	CTS	NC	
Function*		■	■		

Warning

Internal signals are assigned to pins 7 and 8.
These pins should not be connected!

(10) Standardized Connector to Ethernet

Transmission Rate: 10 Mbit/s
Connector: RJ45

Pin	1	2	3	6
Assignment	TD+	TD-	RD+	RD-

(11) Standardized Connectors to ISDN Network

Transmission Rate: 2 x B + D channel per S_0
Connector: RJ45 for S_0 connections

Pin	3	4	5	6
Assignment	T+	R+	R-	T-

(12) U Connector

and RJ11 for U connection
(USA and Canada networks only)

7400

Pin	1	2	3	4	5	6
Assignment			U	U		

7200 (optionally)

Pin	1...	3	4	5	6...	8
Assignment			U	U		

Note The ISDN interfaces have to be used in incremental sequence.

(13) Power Supply 100-240 V AC, 50-60 Hz, 0.375-0.20 A, max. 25 VA

The OPTICODEC has a switching power supply unit. Therefore a voltage selector switch is not necessary.

Power Supply Fuse: 3.15 A in power supply
Type Schurter MXT 315.

Connection 3pole socket

Description

The OC PC Remote software is a 32-bit version for Microsoft Windows 98/2k/ME/XP for the remote control of the OPTICODEC over the RS232 interface using a PC. It covers the same adjustment parameters as the OPTICODEC itself.

Note

To avoid any misunderstanding, the 'OPTICODEC PC Remote' is referred to on the following pages as 'OC Remote' or 'OC Remote software'.

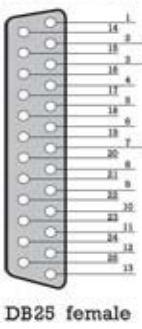
Information

The licensee may not copy the software or the included original documentation or own any such copies. Furthermore, the licensee may not change, adapt, translate, duplicate, loan, lease or in any other form supply the availability of the software or service instructions as a whole or any part thereof. It is strictly forbidden to reengineer or disassemble the software, or in any other way and means attempt to trace the source code. Due to the further development for product improvement of the present series units and alterations of certain industrial parts, it cannot be avoided that some parts might not be fully compatible. Different component modifications can lead to different configuration options. Deviating program sections in the software are therefore possible.
All technical information may be subject to change without notice.

Connection to PC

The connection between the PC and your OPTICODEC occurs via a serial 9-pole or a 25-pole cable (KB003 male/female).

Connected to PC — Connected to OPTICODEC



System requirements: Microsoft Windows 98/2k/ME/XP and a free PC serial interface.

Download of the OC Remote Software

Start the setup program of the current application from the Internet or from the delivered data medium with a double-click on the setup icon. Follow the installation instructions on the PC screen.

With double click on the icon you start the application. After a short initializing sequence the basic configuration menu of the connected OPTICODEC appears.

Program Configuration

A mouse click on the 'Program' menu opens a pulldown menu.

This configuration is only necessary if 'TIMEOUT!' is displayed and not 'STANDBY'. With the menu item 'Program Configuration' you can adapt the PC serial interface and adjust the display colors.

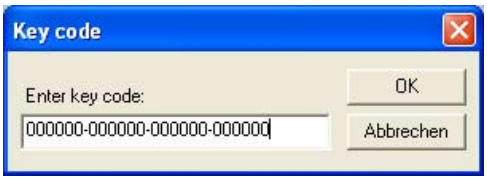
A safety query to appear before a connection is disconnected can be set up by activating the 'Confirm disconnect' check box.

Via 'Default Input' you can select the audio input by using of the Direct Dial Buttons. You can choose between: Analog, AES/EBU and S/PDIF.

Confirm yor settings with 'OK'.

Release of Additional Features

The menu item 'Enter key codes' is used for release of additional features (e.g. the 4SB ADPCM algorithm). The release is dependent on the unit model and its serial number. Each unit receives a unique key code. This function is only active in the standby mode.



About OC Remote

A window is displayed over the next menu item called "About OC Remote" where you will find information on the version number, creation date and manufacturer of the OPTICODEC PC Remote software.

Info

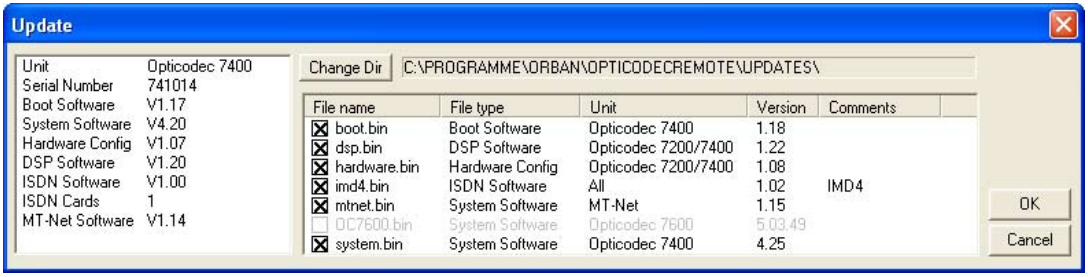
This function is found on the 'Unit/Info' pulldown menu and serves to display the latest software versions of the connected OPTICODEC unit.

All software parts with their corresponding versions are displayed. You can also interrogate the serial number of your OPTICODEC.

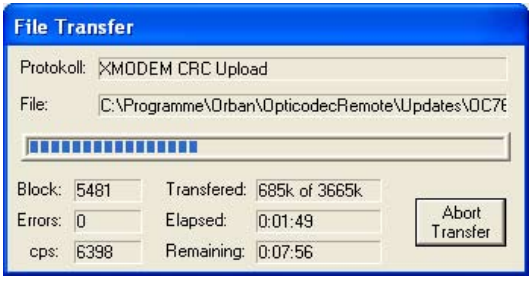
Software Update

This function is found on the 'Unit/SoftwareUpdate' pull-down menu.

If necessary, please store the device-specific *.BIN file on your local hard drive under Program Files/Orban/OpticodecRemote/Updates. The program automatically recognizes the connected OPTICODEC and which software parts are to be updated.



A dialogbox accompanies you throughout the update and informs you about the current process.



The OPTICODEC 7400 shows the update process in the display.

Warning Do not switch off your PC or OPTICODEC during the update process.

Damaged or incompletely loaded software always causes an error message. After a failed update, you may repeat the update process.

OPTICODEC Update Interrupted

If the software update was interrupted, for e.g. due to a user or computer error, please observe the following:

Switch the unit OFF and ON again. In most cases the unit displays an error message about that part of the software which had not been loaded completely and a reload is requested.

DSP Software

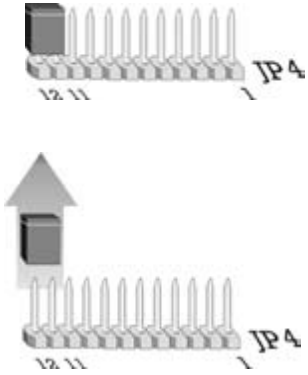
In case of the DSP software an error message might not be displayed after switching the unit on and the main menu is displayed as normal. The error message is only shown once another algorithm has been selected, e.g. G.711.

System Software

If the system software is damaged or not completely loaded, an error message is always displayed.

Hardware Configuration

An interruption during the update of the hardware configuration might have the effect that the unit cannot be started again, the display is blank. In this case the unit has to be opened and a jumper has to be set.



Connect the pins 11 and 12 on JP4 with a jumper. When the unit is switched on again, a boot menu is shown. In this setting each file can be reloaded using the external update software.

Warning
The jumper has to be removed after the update!

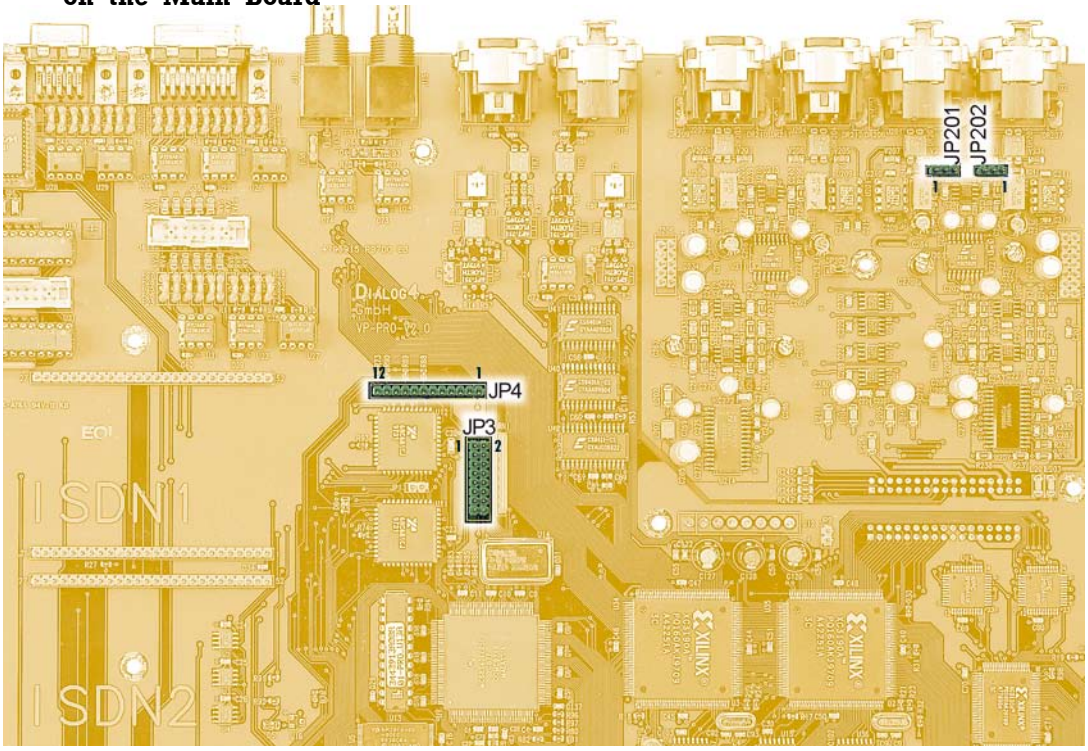
Boot Software

The update of the boot software is realized in two phases. In the first phase the software is downloaded from the PC to the unit. If the update is interrupted during the first phase, the unit only has to be started again.

The software is programmed into the unit during the second phase. This takes about 5 seconds. This process can only be interrupted by switching the unit off or by a power supply failure. After this interruption the unit cannot be started again, not even by the above described emergency start. It can only be reloaded by ORBAN Europe GmbH in Ludwigsburg/Germany.

Important Jumper Settings on the Main Board

Attention
Unplug power supply cable before opening the unit!



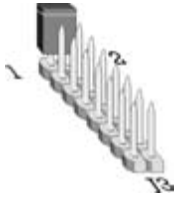
Input Impedance

Switching over the input impedance ANALOG INPUT (pls. see page 11)

Jumper JP 201/202 1 + 2 set: 600 Ohms
2 + 3 set: ≧10 kOhms

Switch over RS232/RS422

Switching over from RS232 to RS422 (pls. see page 13)



Jumper JP3 1 + 2 set: REMOTE port operates in RS422
1 - 2 open: REMOTE port operates in RS232

Data Input

In standby mode select 'Data Input' from the main menu or alternatively the 'Data/Edit local directory' pulldown menu..

The telephone directory appears (ISDN/IP Directory).

The window and columns widths are variable and can be modified with the mouse.

Creating a New Recipient

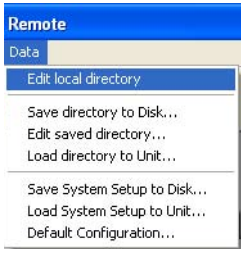
Open the input mask by clicking onto the function 'New'. Here you have the choice between ISDN or Ethernet.

ISDN Connection

Depending on the number of installed ISDN modules, the writeable input fields are represented white. Two B-channels are available for each ISDN module. Activate an input using the mouse. The positioning marker of the cursor blinks when the number can be entered. Move between ISDN input fields using the tab key.

Once the ISDN numbers have been entered, you can assign a name to the recipient (max. 49 characters).

Edit Recipient

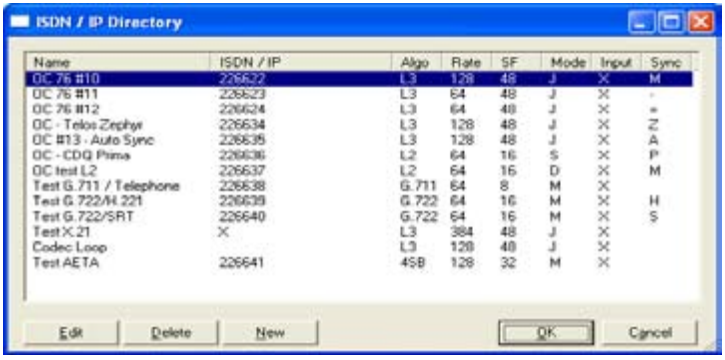


The ISDN/IP address directories of the connected ORBAN OPTICODEC 7600, OC 7400, CTAXI or PAN-PRO can easily be imported and exported via the 'Data' menu to your PC for more efficient management.

Select the entry you want to process from the ISDN/IP directory using the 'Edit' key or with a mouse double-click.

To delete a recipient click with the left mouse button onto the entry in the ISDN/IP directory you would like to delete and press the 'Delete' key..

Deletion takes place after confirming with the 'OK' key.

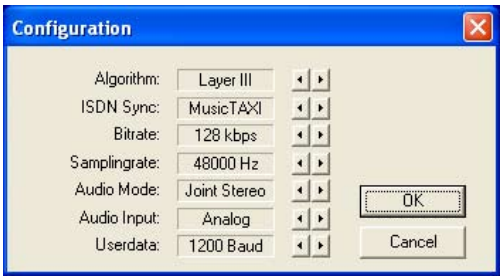


Alterations of the default audio configuration can be made by clicking onto the 'Change' key.

The configuration menu of the audio parameters which are assigned to the current entry appears. By activating the arrows (left-right) you can change the pre-settings.

Algorithm

The 'Algorithm' menu item is used for presetting the desired data reduction procedure on outgoing calls.



By pressing the arrow keys, you can select between Layer 2, Layer 3, G.722, G.711 and 4SB ADPCM (optional).

ISDN Sync

The 'ISDN Sync' menu item is used to set the desired synchronisation procedure of the partner codec.
The available sync modes for Layer 3 are:
AUTO – automatic codec detection
MusicTAXI (MusicTAXI sync for 1 to 6 B-channels)
NO SYNC for the use of 1 x B-channel
NO SYNC (INV) for the use of 1 x B-channel
ZEPHYR (Telos sync for 2 B-channels)

For Layer 2:
AUTO – automatic codec detection.
MusicTAXI (MusicTAXI sync for 1 to 6 B-channels)
NO SYNC for the use of 1 x B-channel
NO SYNC (INV) for the use of 1 x B-channel
PRIMA (CCS sync for 2 B-channels)

AETA (for 4SB ADPCM; optional)

The activation for AETA sync and 4SB ADPCM algorithm (not included in the standard delivery) is performed as described on the page 20.

Bitrate

According to the setting of the algorithm and the number of outgoing B-channels, the transfer rate is set here: 64, 128, 192, 256, 320 or 384 kbps for layer 2 and 64, 128, 192, 256 and 320 kbps for Layer 3.

Samplingrate The 'Samplingrate' menu item is used for setting the desired sampling frequency on outgoing calls.
You can choose between: 16, 22.05, 24, 32, 44.1, 48 kHz, AUTO (the sampling frequency of the addressing device is used)

Audio Mode The 'Audio Mode' menu item is used for setting the desired audio behaviour on outgoing calls.

Mono	mono signal. The left input is used..
Dual Mono	two different signals which do not jam each other, e.g. left channel: original soundtrack; right channel: translation
Stereo	as for Dual Mono, each channel is encoded separately, but with the difference that a channel is allocated excess bits if less or no audio is transmitted on the other channel (i.e. bit distribution as needed).
Joint Stereo	comparable with MS stereophony (middle/ side signal). Encodes the sum between left and right and the difference between left and right; these are encoded and transmitted separately (subjectively better quality at low data rates).

Audio Input The 'Audio Input' menu item is used for setting the desired audio input on outgoing calls. You can choose between: Analog and AES/EBU and S/PDIF.

Userdata The menu item 'Userdata' is used for setting the desired ancillary data on outgoing calls.
You can choose between:
OFF (no ancillary data is transferred)
1200, 2400, 4800 baud with Layer 2 and 3.

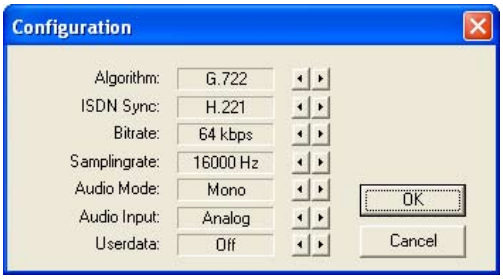
Note If the ancillary data is switched off (OFF), no remote effect signals are transmitted either.

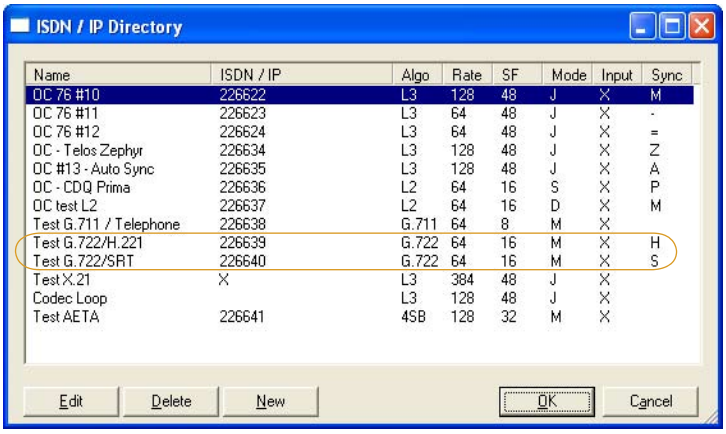
Between OPTICODECs, the smallest preset baud rate of the ancillary data is used in the context of the device handshake.

G.722 Connection with H.221 or SRT Sync

If you enter a G.722 partner in the 'Data Input' menu, please observe the following order:

1. Enter the ISDN number.
2. Enter G.722 in 'Algorithm'
3. Determine the Sync modes in 'ISDN Sync'.





Now H=H.221 or S=SRT is displayed in the directory for the selected SYNChronisation procedure.

X.21 Connection

To activate the X.21 interface, enter an 'X' in the ISDN field (e. g. position #11 in directory).

Codec Loop

If the input fields are empty, the OPTICODEC starts the 'codec loop' mode. This serves as a test for the coded audio signal (without ISDN, e. g. position #12.)

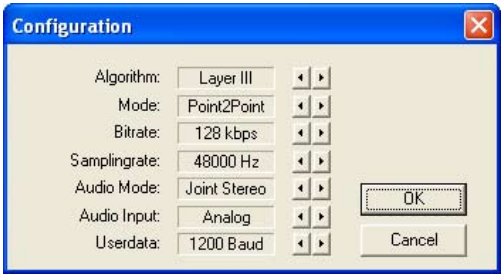
Ethernet Connection

Should an Ethernet connection be desired, please activate the radio button for Ethernet. Enter the target address and, for easier identification, also enter the name of your connection partner.

You may enter both IP address and plain-text names* (* only if a name server also exists).

IP Connection

In the same way as the description of ISDN connections, you can set the audio parameters for the planned connection here. The menu guides you through algorithm (Layer 2 and Layer 3), mode, bitrate, and finally userdata.



Mode

The target address to be entered is dependent on the desired transmission mode. The entries can be changed by activating the arrow keys. The following IP connection types are possible: Point-to-Point, Transmit and Receive.

Point-to-Point

A bi-directional connection between two units. TCP is utilised as the protocol, possible transmission errors are corrected to a certain degree by this protocol. These entries are marked with an "X" in the Sync column of the directory.

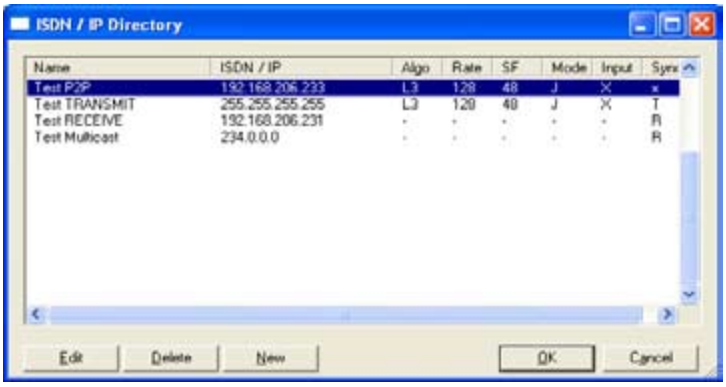
Should 'Point-to-Point' be set for the mode, then the IP address of the partner unit is to be entered.

Transmit

The unit functions as a transmitter for broadcast or multicast transmission. UDP is utilised as the protocol, possible transmission errors can not be corrected. In this mode, the unit transmits to one or more receivers. Bidirectional UDP connections are possible when both units are set to TRANSMIT. Marked with "T" in the directory.

Receive

The unit functions as a receiver for a broadcast or a multicast transmission. This setting is the opposite of TRANSMIT. Marked with "R" in the directory.



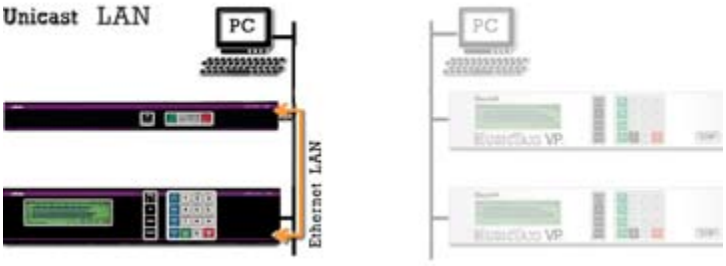
For TRANSMIT and RECEIVE it is to be distinguished whether a broadcast or a multicast transmission is desired.

Broadcast A broadcast address must be entered for the unit set to TRANSMIT (for e.g. position #2 in the directory: 255.255.255.255). The unit set to RECEIVE dials the address of the partner unit. This is the address of the unit set to TRANSMIT.

Multicast Here the same address has to be dialed from both the TRANSMIT and the RECEIVE units. This has to be a multicast address found in the number range from 224.0.0.0 to 239.255.255.255 (for e.g. position #4 in the directory: 234.0.0.0).

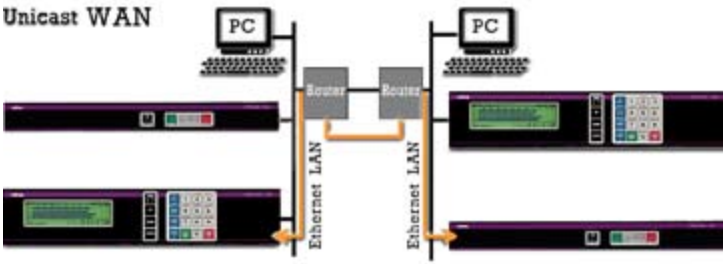
Applications

Unicast Describes the POINT-TO-POINT bi-directional data transmission from one unit to another within the same network (LAN) or another network (WAN).



LAN Local Area Network (Ethernet, Intranet). According to ISO, LAN is a locally strongly limited network mostly installed within company headquarters.

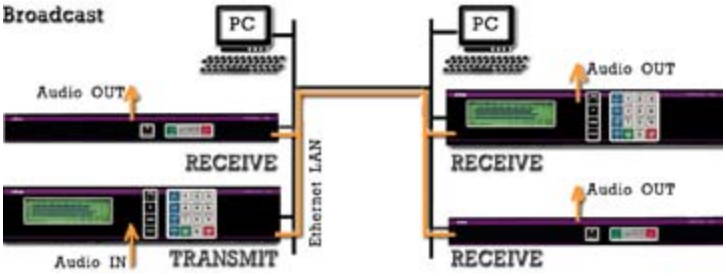
WAN



Wide Area Network. Long-distance data traffic networks such as the Internet or connections using ISDN units.

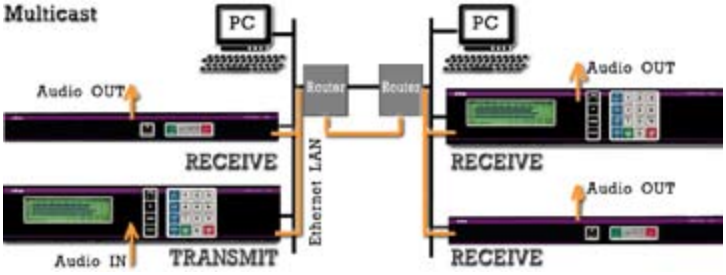
Broadcast

Describes the data transmission from one unit to all of the other units within the same network.



Multicast

Describes the data transmission from one unit to all of the others within the same network or another network.



The multicast mode should preferably be used instead of the broadcast mode. Important is therefore the agreement between connection partners of suitable application and protocol types. The following is a brief comparison:

Multicast

Only the units of a multicast group receive the data, all other units remain unloaded.

A large selection of routers which support multicast are available.

Broadcast

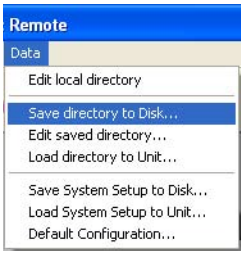
All units within the network receive the same packet which they then have to analyse even when the packet has not been directed to all units. This results in an unnecessarily high processing power load. Several broadcast transmissions could possibly even cause disturbances in these units.

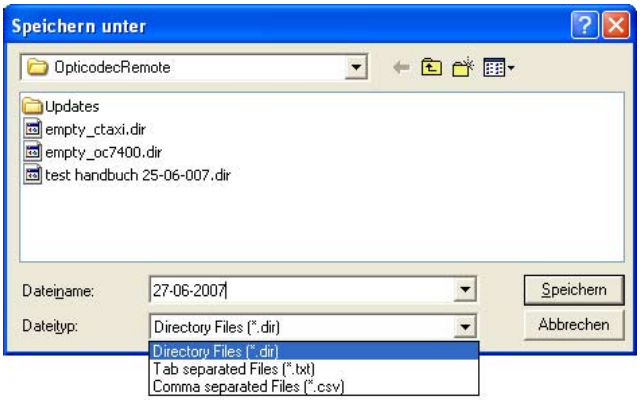
Routers which are able to direct broadcast transmissions to other networks are not customary.

Tip The local ISDN/IP directory is saved in the 'OpticodecRemote' program directory as a 'num.dat' file. This directory can be easily exported to any number of PCs, hence saving time by copying the same address book directory to all of them.

Saving the Unit ISDN/IP Directory to your PC Harddisk

Use the feature 'Save directory to disk' to store the ISDN/IP directory of your unit on PC.



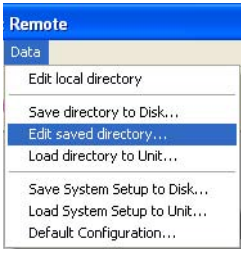


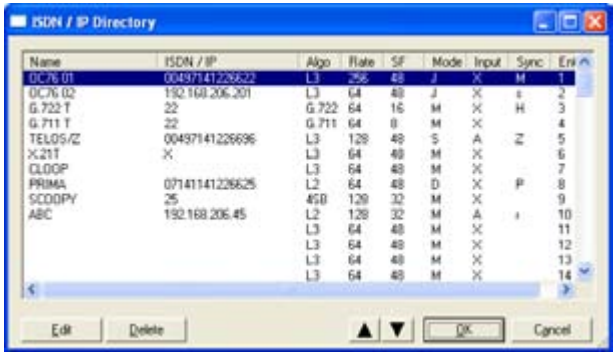
Do this by selecting the file format you require, either Directory File (*.DIR), Text separated Files (*.TXT) or Comma separated Files (*.CSV) and importing the address book into MS Word or Excel, for example. These file formats can also be exported to the unit.

However, the program's own editor can run only *.DIR file formats.

Edit saved directory

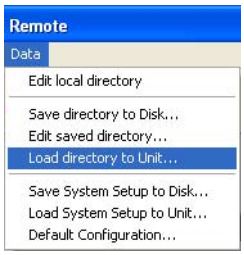
The entries can be edited, newly entered, deleted and sorted by means of the 'Edit saved directory' function.

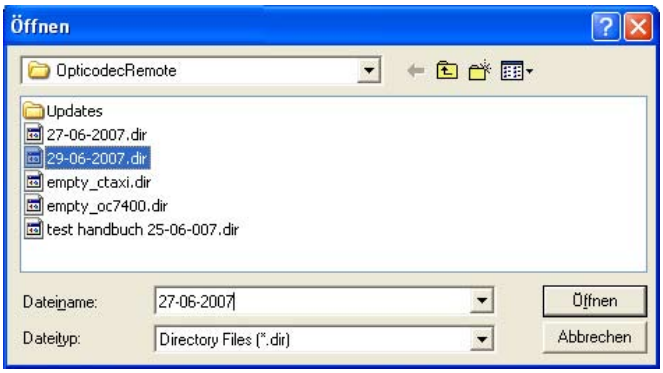




Loading ISDN/IP Directory to a Unit

Click onto 'Load directory to unit', locate the desired *.DIR file and finally activate the 'Open' key.





Select from the directory the desired file format.

All 96 entries (connection partners) with their names, ISDN numbers/IP addresses and set audio parameters are now loaded to the unit.

It is irrelevant whether all or only some of the entries have been occupied or whether they are all or partly vacant; or whether the connected unit is an OPTICODEC 7600, OC 7400, CTAXI or PAN-PRO.

Exporting the directory can easily be repeated should it fail because of for e.g. a power down or power failure.

Configuration of the connected OPTICODEC in System Setup

Select 'System Setup' from the 'Unit' pulldown menu. The basic configuration menu of the connected OPTICODEC differs in appearance depending on the unit type and its equipment.

TCP/IP Basics

In this menu item the basic settings of the unit within the network are entered.

Local IP Address

In the data entry mask, enter the IP address of your OPTICODEC. Be aware that every connection to the network must possess its own unique IP address.

Subnet Mask

The 'Subnet Mask' is used to subdivide a network into smaller subnets, in order to reduce the data traffic to the subnets and/or permit better administration of the data traffic.

Default Gateway

The data exchange occurs between the various nodes in the network with complete transparency to the user. However, the IP software detects when a data packet is intended for a different subnet and sends it to the corresponding gateway.

If necessary, you can enter the IP address of a router here. Otherwise, 0.0.0.0 must be entered.

You will be informed of the IP address, Subnet Mask and Default Gateway by your network administrator.

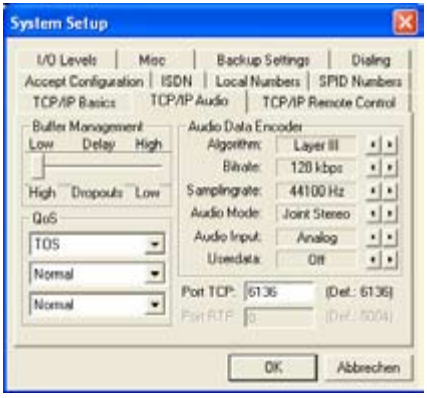
Dialing

Dialing Attempts This menu item serves for setting the desired dialing attempts. You can select between 1 ... 5 and INFINITE.

Dialing Delay This menu items serves for setting the desired time between dialing attempts (between 10 and 360 seconds).

Redialing Attempts This menu item serves for setting the desired redialing attempts, if a connection had not been disconnected by the calling OPTICODEC. You can select between 0 ... 9 and INFINITE.

TCP/IP Audio The settings for audio transmission over the network are found in this menu.



Buffer Management This buffer is used to bridge short interruptions in the data transfer. The size of the buffer (which temporarily holds the data from the network) can be influenced.

To ensure the most secure transfer possible, the maximum value (bar all the way to the right) should be set; however, this results in a longer delay.

If more value is placed on having a shorter delay, then the bar can be moved to the left; however, this has a negative impact on the transmission security.

To permit the best possible transmission security with a short delay, you should ensure that no additional devices/ workstations apart from the OPTICODEC are transmitting data over the network.

Quality of Service

Not all applications have equal status for data transfers, and not all applications require the same high standards for data transfers. To minimise or prevent the risk of bottlenecks in data networks, the IP header implements the so-called 'Quality of Service (QoS)' in addition to the identifier fields such as time to live, protocol and header checksum.

If the router is configured accordingly, QoS actively regulates the load status on the network and uses the available bandwidth intelligently and effectively on the basis of data prioritisation or bandwidth reservation.

Type

TOS (Type of Service) or DiffServ (Differentiated Service Architecture) are the key mechanisms of QoS and are responsible for the assessment of packet priority.

TOS

The TOS bits contain information on the ways and means of how a datagramm should be handled by a router. An overloaded router can, for example, on the basis of the TOS field determine which packets are less important (and can therefore be cancelled) and which packets must essentially be forwarded.

Precedence Values

Precedence	Significance	Precedence	Significance
000	Normal	011	Flash
010	Priority	100	Flash Override
010	Immediate	101	Critical

TOS Values

TOS	Significance	TOS	Significance
0000	Normal	0010	max. Reliability
1000	min. Delay	0001	min. Monetary Cost
0100	max. Throughtput		

DiffServ

DiffServ uses a new definition of the IPv4 TOS header field and IPv6 traffic class header field.
The goal of DiffServ is to subdivide the data traffic into service classes with different priorities, without using the intensive signalling on each router. Each packet can be marked and is handled and transmitted accorded to this marking.

DiffServ Codepoints (DSCP)

Each per-hop-behaviour (PHB) flow is determined by a DSCP. You can choose between: Standard (Default, 'Best Effort'), Class Selector 1-7, Assured Forwarding 11-13, 21-23, 31-33, 41-43, and Expedited Forwarding.

Note

Details and additional specifications can be found in the generally available 'Request for Comments' lists (RFC1349 TOS; RFC2474 DiffServ) on the Internet (www.rfc-editor.org).

Audio Data Encoder

This encoder configuration is taken over when the OPTICODEC is called by another OPTICODEC over IP. The pre-settings are AUTO.

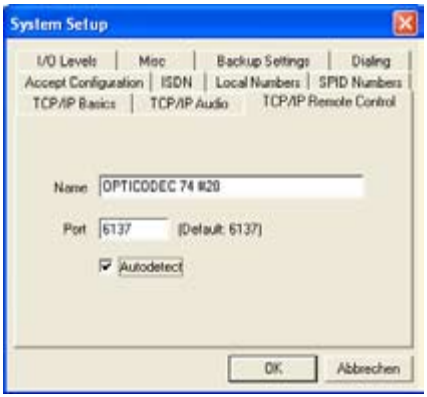
Descriptions of the individual functions can be found starting page 26.

Audio Port (TCP)

This menu contains the setting for audio transfer over the network with TCP and UDP protocols.

For the OPTICODEC, the value 6136 should always be entered.

TCP/IP Remote Control



Unit Name

For easier identification of devices on the network, the name of your OPTICODEC must be entered here without name length restrictions. This name is transmitted to the 'NETControl' program and shown in the device list.

Port

An important part of the TCP/IP model are the port numbers, also known as socket numbers. With these ports, it is advised which service is desired.

One distinguishes between two categories of ports:
the so-called 'defined' or 'well-known ports', which are assigned by IANA (Internet Assigned Number Authority) and which cover a number range from 0 to 1023;
and the "dynamic ports". Therefore only port numbers from 1024 to 65535 may be entered here.

For the OPTICODEC, the port number 6137 is to be entered.

A comparison between TCP/IP and ISDN:

TCP/IP	**ISDN**
IP Address	ISDN Number
Port	Bearer capability (for e.g. telephone / data transmission)

Autodetect

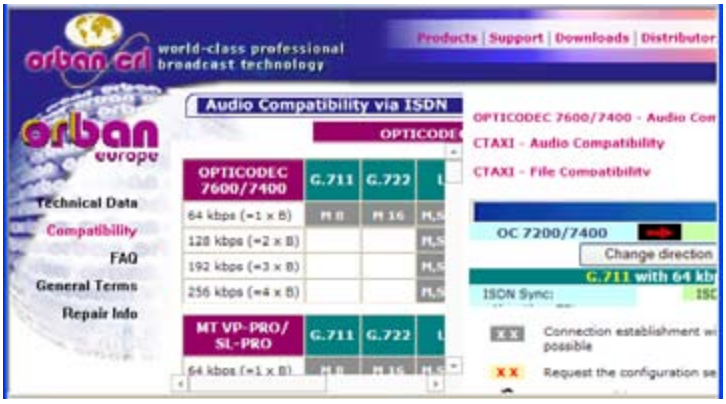
This function is for the automatic recognition of units using a control software such as NETControl and can only be used in a local area network. For the control of units outside of the network area, this function should remain disabled.

Accept Configuration

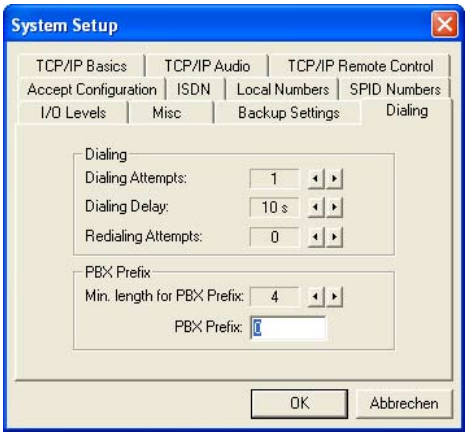
This point determines the call accept mode of the OPTICODEC. You can set the accept mode more or less specific for the unit and transmission permanently.

Then the OPTICODEC only accepts calls in the respective configuration. Or you can select the operation mode AUTO(matic Codec Detection). The OPTICODEC serves as a 'SLAVE' and takes over the parameters of the calling unit automatically. The 'AUTO' mode is not available for 'Audio Input' and 'Userdata'. Descriptions starting page 26.

Statements about the audio compatibility (via ISDN) with external codecs can be found on the supplied data carrier or on the Internet at: www.orban-europe.eu.



Dialing



Dialing Attempts This menu item serves for setting the desired dialing attempts. You can select between 1 and 5.

Dialing Delay This menu item serves for setting the desired time between dialing attempts (between 10 and 60 seconds).

Redialing Attempts This menu item serves for setting the desired redialing attempts, if a connection had not been disconnected by the calling OPTICODEC. You can select between 0 and 5.

PBX Prefix Under certain conditions (e.g. private branch exchange PBX), a number that prefixes the ISDN number for dial-up via ISDN can be entered here. To make an outside call from a telephone system, for instance, enter 0.

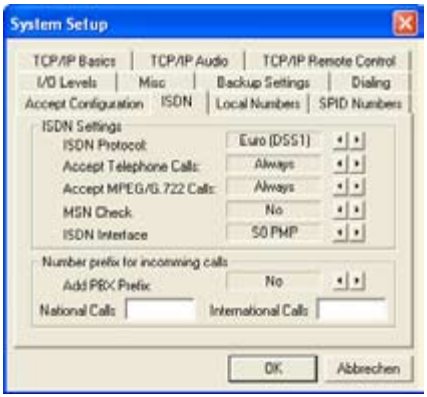
A preselection number can also be entered here. The number max not exceed five digits.

Min. length for PBX Prefix Using the 'Min. length for PBX Prefix' menu option, define the minimum number of digits an ISDN number must have to allow this prefix to be set before the number.

If, for example, internal extension numbers have three digits, a 4 should be entered here.

To continue to enable internal calls, PBX dialling codes for ISDN numbers with less than four digits are ignored.

ISDN Configuration



ISDN Protocol

The OPTICODEC has two ISDN D-channel protocols: EURO (DSS1) and NATIONAL 1 (North America).

For use in the USA, the OPTICODEC is equipped with 'IMD4' type ISDN modules. This is necessary if additional U interfaces are required for North America.

Warning

Decisive is the ISDN protocol of your connection, not the one of the partner unit! You can alter the settings by pressing the arrow keys.

Accept Telephone Calls

This menu item serves to define the OPTICODEC behavior when operated at a S_0 connection together with other units.
You can select between:
ALWAYS every telephone call is accepted
NEVER every telephone call is rejected.

Accept MPEG/G.722 Calls

In this menu item the call acceptance for MPEG and G.722 calls is defined. The settings are the same as the menu item (Accept Telephone Calls).

MSN Check

In case of a passive call, the interrogation of the MSN number can be activated or switched off. If 'YES' is entered for MSN check, the called number is compared to the one which has been entered in Local Numbers. The call is only accepted, if both numbers are identical.

In case of EURO ISDN, the MSN is usually the ISDN number of your connection without the area code, in case of private exchanges only the number of your extension.

The 'YES' option should only be activated if, in addition to the OPTICODEC, other devices (e.g. a telephone, fax machine, PC card) must also be operated on the same ISDN connection.

Warning The incorrect configuration of only one unit might result in the rejection of all calls

ISDN Interface

Via this menu item, the S_0 and U interfaces used for the transfer are selected:

S_0 PMP (Point-to-Multipoint)	for multiple device connection. (This is the usual connection type.)
S_0 PP (Point-to-Point)	for equipment connection
U PMP (Point-to-Multipoint)	for North America only (using a ISDN module type 'IMD4').

Number Prefix for incoming calls

These settings concern incoming calls for OPTICODEC 7200 and 7400. If the 'Add PBX Prefix' option is set to 'YES', the number from the PBX Prefix (see 'Dialling', page 40) is inserted before the number for incoming calls. The minimum number length applies here too. This setting is required only for those ISDN systems that do not automatically add the ISDN number.

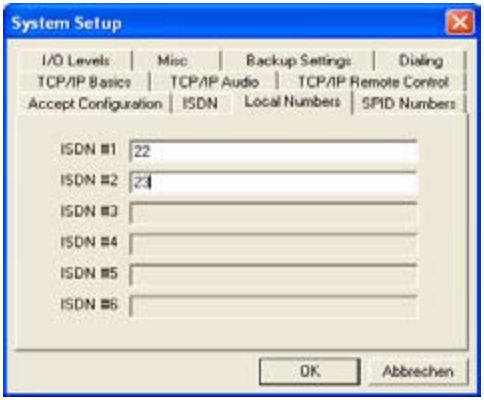
For direct S_0 connections with EURO ISDN, the leading zeros in the ISDN numbers are not transferred for incoming calls, e.g. 7141226622. This can be corrected by means of the following entries.

If a 0 is entered for 'National Calls', this is added here. The same applies for 'International Calls', where 00 is to be entered in Germany.

When these digits are entered, the ISDN number required to make the call will actually be displayed.

Local Numbers

The ISDN numbers entered here are sent when the connection has been established. Under certain conditions (e.g. private branch exchange (PBX)* type), the individual ISDN number must be entered.



	S_0 without PBX*	S_0 on PBX*
1 x unit only	can remain vacant or ISDN number without area code	can remain vacant or only the No. of your extension
n x units	ISDN number without area code and MSN Check activated	only the No. of your extension and MSN Check activated (Test Called Number)

Note If a local number is required, then all of the entry windows must always be confirmed.

SPID Numbers

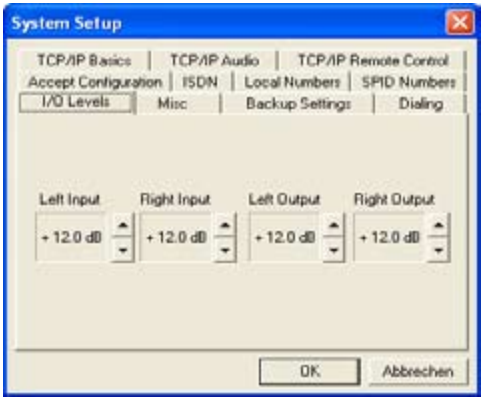
The identification numbers entered here are sent when the connection has been established. They are only necessary when operating the OPTICODEC on US and Canadian networks.

The identification numbers are entered and allocated as described in 'Local Numbers'.

You will be informed of the SPID number by your ISDN provider. These input fields otherwise remain empty.

I/O Levels

This menu item serves for setting the analog Input and Output levels for the left and right channels.



Ex-factory the setting is +12 dBu, the headroom is 0 dB. This means: input level = output level = 12 dBu. With a mouse click on the 'up' and 'down' arrow keys the level value can be altered.

Misc

Alarm Signals

If these signals are switched OFF, the relevant switching information of the OPTICODEC inputs is transferred to the partner unit. Otherwise you can select between:

CON	The signal is set to pin 19 once the decoder has been synchronized i.e. when the connection is 'OK'.
DIS	The signal is set to pin 18 if the line has been disconnected from the partner unit or because of an ISDN error.
CON+DIS	Both signals are set.

Level Range This menu item allows the adjustment at the level range: 50 or 80 dB.

Headroom This menu item serves for setting the desired headroom. You can select between 0 and 20 dB in 1 dB steps. Ex-factory the setting is 0 dB.
The scale display in the online menu is moved.

Warning Clipping limit at 0 dB + selected headroom!

External Sync Input The OPTICODEC has a sample rate converter at the audio input and output. For the external synchronization of the digital output you can select between:

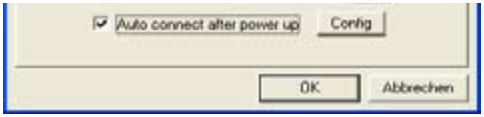
DISABLED Word clock is generated from the ISDN transmission clock
DIGITAL IN Word clock is generated from the AES or S/PDIF input signal
SYNC IN Word clock is taken over from SYNC IN.

Backlight This function serves to set the display background lighting of the connected unit:

ALWAYS ON background lighting is always on

ON CONNECT the background lighting switches on once a connection has been established or when the 'System Setup' or 'Data Input' menus have been called up. The lighting switches off shortly after returning to the main menu.

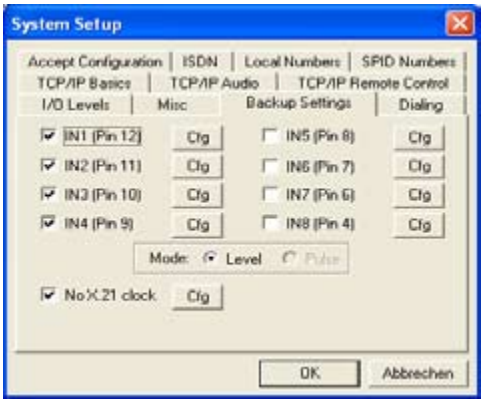
Automatic Connection Start



When 'Auto connect after power up' check box is activated, the unit automatically begins establishing a connection once it has been switched on. The configuration used here is set up using the 'Config' key.

Backup Settings

In the 'Backup Settings' mode you can allocate an entry of the ISDN directory to each input port of the Alarm/Control Interface.



To do this, you must select the requested input port. Press the 'Cfg' (Configuration) key to allocate an ISDN number to this input port.

This ISDN number complies in all parameters to the respective entry in the ISDN directory.

In the following example, the entries IN1 to IN 4 for backup are utilised.

The entries IN5 to IN8 have not been allocated and are transmitted transparently to the opposite side. A feedback to confirm whether connection has been established takes place over the respective outputs of the Alarm/Control Interface. When, for example, a connection has been established with IN2, the output OUT2 is activated once the connection has been established and the decoder has been synchronised.

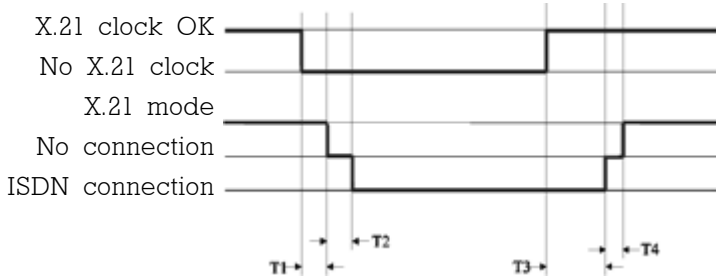
Further information on applications of Backup Settings can be found on page 75.

X.21 Clock Monitoring

To do this the 'No X.21 clock' must be activated. Enter with the corresponding Cfg button, the ISDN number of the partner unit which should be dialed in case of error. The desired configuration is also entered.

When the unit is in the X.21 mode and the X.21 clock fails, the unit returns to the main menu and the ISDN connection is then established.

As soon as the X.21 clock is active again, the ISDN connection is disconnected and the unit returns to the X.21 mode.



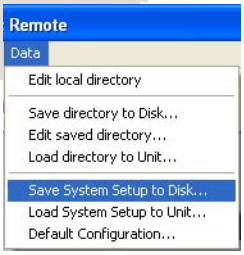
T1: Time, how long the X.21 mode must fail before the ISDN connection is established.
T2: Length of time for an ISDN connection to be established.
T3: Time, how long the X.21 clock must again be active before the ISDN connection is again disconnected.
T4: Length of time for ISDN connection and change into X.21 mode.

Times:	T1	T2	T3	T4
(sec.)	2	5-30	5	1-2

For the settings when using OC Remote with the OC 7400, please see page 77.

Mode: Level As soon as a switching signal is applied to the corresponding input INx, the connection is established and continues until the switching signal is disconnected.

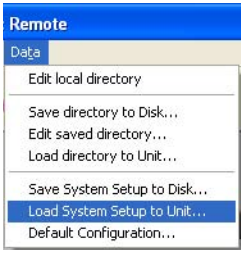
Saving the Units System Setup to Your Harddisk



Similarly to that of the ISDN/IP directory (pls see page 30), there is alternatively the possibility to save the system configuration of the OPTICODEC onto your PC harddisk for archive purposes, for example.

Use the 'Save System Setup to Disk' feature to store the unit specific *.CFG data file in a folder of your choice.

Loading System Setup to a Unit

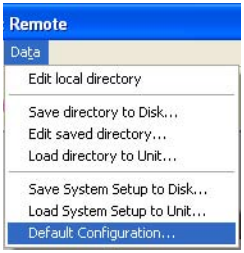


By using the 'Load System Setup to Unit' feature, the system configuration already stored on your PC can be loaded onto the OPTICODEC units.

Locate the *.CFG data to be loaded and press the 'Open' key.

Any number of OPTICODEC units can easily be configured with identical 'System Setup' settings using this procedure.

Default Configuration



With this menu item all previous configurations are reset to those ex-factory.

After the safety query, confirm with the 'OK' key should the default procedure be carried out or use 'Cancel' should you wish to cancel the command to default.

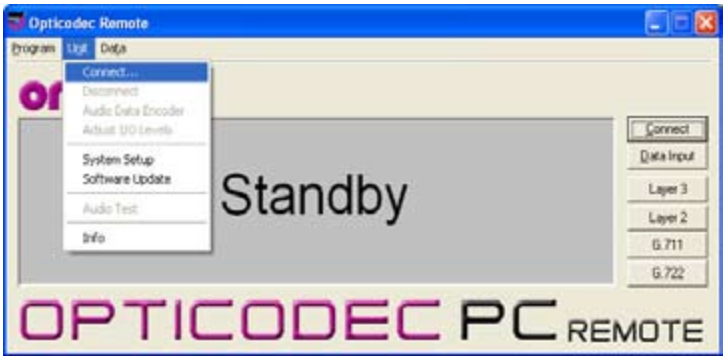
Warning This process can not be reversed after confirmation!

Connect

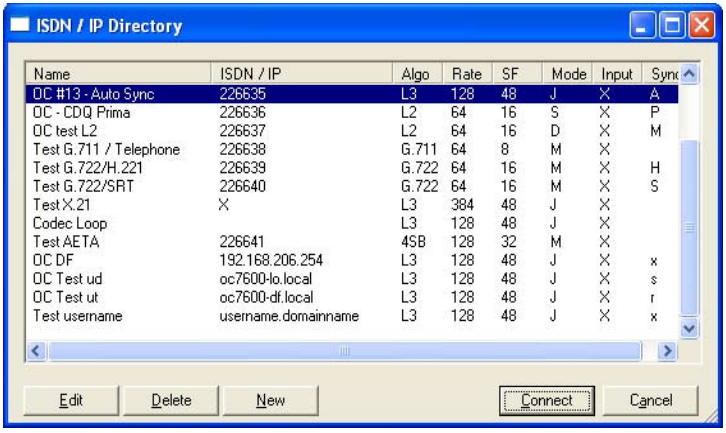
The respective connection can be established quickly and easily. A pre-requisite for the connection establishment is the correct initializing of the OC Remote software with the connected OPTICODEC. This is confirmed with the 'Standby' status message in the program screen.

Establishing a Connection Using the ISDN/IP Directory

Select the 'Connect' key from the main menu or choose alternative the 'Unit/Connect'. pulldown menu.



The present ISDN/IP directory appears.



Assigned to each entry you will find the name of your connection partner, the ISDN number, IP address or target address, the selected audio parameters as well as the sync mode of your partner unit.

Establishing Connection

Select your ISDN connection partner from the list using the mouse. The selected connection partner is marked and displayed inverted. Press 'Connect' to confirm. The connection is now being established.

After successful synchronization, your OC Remote program displays the message 'Connected' and goes to the online menu. If the connection is rejected, the OPTICODEC displays 'Rejected' and the reason for the rejection. Analyse the error message using the error codes listed in the appendix (pls. see page #44).

Establishing a Connection Using the Direct-Dial Buttons

This type of connection is established via the four preprogrammed keys, located right from the display.

The transmission quality must first be determined. By pressing a key, you select between G.711 (3.1 kHz, telephone), G.722 (H.221 or SRT), Layer 2, Layer 3, AAC* or 4SB ADPCM* (*optional).

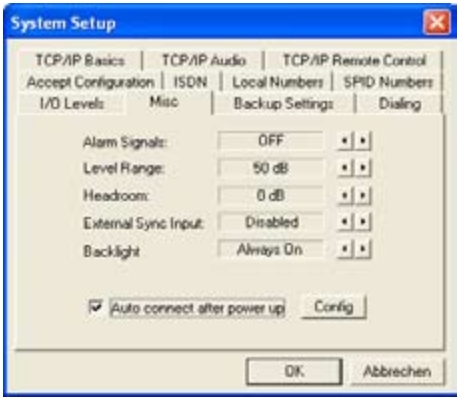
The entry menu then requests the ISDN number, target or IP address which is entered with the numeric keypad as usual.

Note

The connection parameters for Layer 2 and Layer 3 are determined as follows: Only entry of the first ISDN number. 64 kbps, 48 kHz, Mono, User Data 1200 baud.
For the entry of two ISDN numbers: 128 kbps, 48 kHz, Joint Stereo, User Data 1200 baud.
The audio input used is taken from the Accept Configuration. The ISDN Sync used is always AUTO.

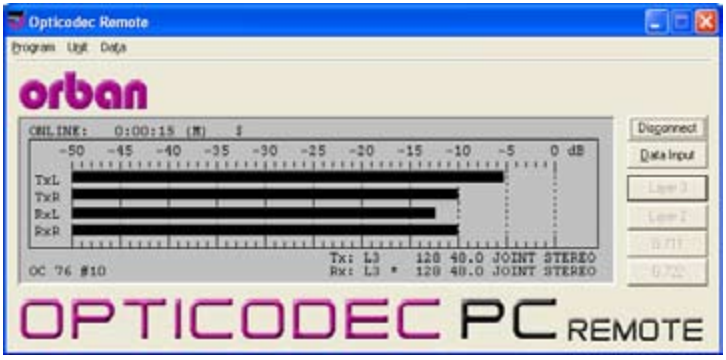
Automatic Connection Start

On switch-on or e.g. after a power outage, the OPTICODEC automatically establishes a connection provided that the 'Auto connect after power up' check box is activated and a target number or address has been allocated.



Connection Monitoring

After the establishment of the connection and the exchange of the transmission parameters, the online transmission menu appears on the display.



It shows information about the send and receive levels, connection duration and the set headroom and synchronisation.

In addition, together with the send (Tx) and receive configuration (Rx), the IP address / ISDN number (according to the connection type) of your codec partner are shown on the display.

$ Currency Icon

After the establishment of an ISDN connection, in addition to the connection duration, the currency icon ($) is also activated. The actually incurred connection costs can only be displayed on an S_0 from Deutsche Telekom after activation.

Sync Icon

If the decoder of the connection partner receives the correct data, then this is confirmed by the Sync icon in the Rx path. The Sync icon is only available between OPTICODECs during Point-to-Point or ISDN connections in Layer 2 and Layer 3.

Adjust Audio Parameters

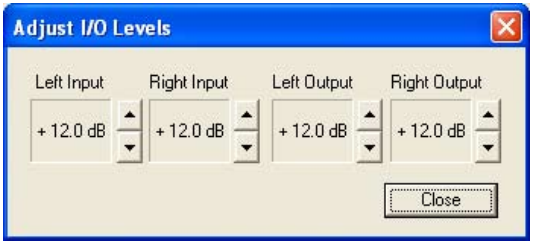
During a live connection, you can place a query without interrupting the line and change the audio parameter settings.

This function is available from the 'Unit/Audio Data Encoder' pulldown menu.

If a connection is made in 'Layer 2' or 'Layer 3' mode, you can toggle between these algorithms. The parameters between G.711, G.722 and 4SB ADPCM cannot be changed.

Adjust Audio Levels

This menu item serves for setting the analog Input and Output levels for the left and right channels without interrupting the line.



Ex-factory the setting is +12 dBu, the headroom is 0 dB. This means: input level = output level = 12 dBu. With a mouse click on the 'up' and 'down' buttons the level value can be altered.

Establishing a Connection with X.21

From the Directory, select an entry with 'X.21' as the digit of the ISDN number.

Establishing a Connection with Codec Loop

From the Directory, select an entry without an ISDN number. The connection is established via the Directory, 'Quick Dial' or 'Direct Dial Buttons'.

Call Acceptance with ISDN Sync AUTO

The function 'AUTO' (Automatic Detection of the calling Unit) is entered in the 'System Setup / Accept Configuration'.

The function 'ISDN Sync AUTO' has priority over all other entries. This means if 'AUTO' is set and the OPTICODEC is called by any competitor codec, the OPTICODEC sets itself to the audio parameters incl. sync modes of the calling unit automatically. This might last up to 30 seconds.

The set parameters of the 'System Setup / Accept Configuration' are taken over if the OPTICODEC is called by an OPTICODEC.

Establishing a Connection with ISDN Sync AUTO

When a connection partner is entered into the telephone directory, ISDN Sync and audio parameters can be preset in the configuration.

However, an entered 'ISDN Sync AUTO' has priority over all other settings. This means that if a connection has been established to a competitor unit, the OPTICODEC automatically adapts itself to the audio parameters incl. sync modes of the remote unit. This might last up to 30 sec.

Terminating the Connection

An existing ISDN and Point-to-Point connection is ended by pressing the 'Disconnect' key. After disconnection, the message 'REMOTE DISCONNECT" appears on the display of your connection partner.

In the broadcast and multicast modes all connection partners, transmitters and receivers have to press the 'Disconnect' key to disconnect the link.

The OPTICODEC goes into standby mode and waits for further connection requests.

The OPTICODEC 7400 is a fully duplex ISDN audio codec with an Ethernet interface for the remote control of the unit and the possibility to distribute audio over networks such as Intranet, ATM etc. Configuration and operation of the unit takes place using the numeric keypad and/or the control software OC Remote and NETControl.

Further information on the audio and data interfaces are found starting from page 12 of this manual.

Graphical Diplay Module

with integrated LCD controller, 128 CG-ROM and display
W x H x D: 180.0 x 65.0 x 12 mm
Visible Range: 132.0 x 39.0 mm
Display RAM: 8 kByte
240 (horizontal) x 64 (vertical) dots
By 6 x 8 dots per letter: 40 letters x 8 lines, 64 columns

Explanation of Keypad Symbols

ISDN OK ERR OK	indicates a correct or rejected connection of the OPTICODEC. Release by pressing 'Hang Up'. Blinks when a software update is being carried out.
UP	cursor moves upwards
DOWN	cursor moves downwards
ENTER	selected function is confirmed

G.711	activates the G.711 algorithm
Copy	copies a telephone number
⇐	cursor jumps to the left
G.722	activates G.722 algorithm
PgUp	cursor jumps upwards to next page
⇒	cursors jumps to the right
Layer 2	activates Layer 2 algorithm
PgDn	cursor jumps downwards to next page
Layer 3	activates Layer 3 algorithm
Delete	deletes marked number or letter

Numerical keypad

◑– ◑+	contrast adjustment of display (available in standby only)
0,1,2...9 / A,B,C...Z	number / alphabetic character input.

Assignment table:

Key	Character				
1	1	. (point)	/	␣	(space)
2	2	A	B	C	
3	3	D	E	F	
4	4	G	H	I	
5	5	J	K	L	
6	6	M	N	O	(as 'Otto')
7	7	P	Q	R	S
8	8	T	U	V	
9	9	W	X	Y	Z
0	0	, (comma)	+ (plus)	-	(minus)

Other special characters are attainable in certain input fields by using the UP and DOWN buttons.

QUICK DIAL	connection establishment via quick dial
*	X for X.21 connections and possibly required for entry of sub-address

HANG UP	disconnection
Cancel	cancels the last action

Data Input

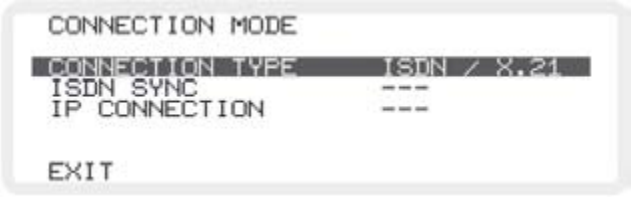
After switching the unit on and after a short initializing sequence the 3 pages of the basic configuration menu of the OPTICODEC 7400 appears (see also „Status Messages", page 82).

After selecting the menu 'Data Input' and confirming with the 'Enter' key, the directory for IP addresses, ISDN numbers, names and audio configurations appears. Here a max. of 96 entries can be stored.

Enter New Recipient

Choose a free position to enter a new connection partner or choose an already existing entry for a possible correction. Confirm with the 'Enter' button.

Connection Mode



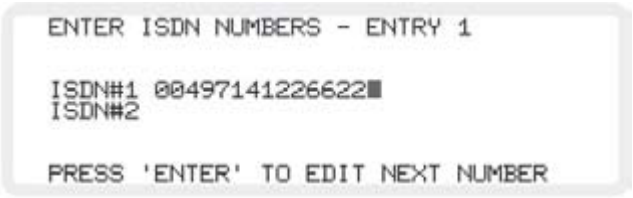
First choose the desired connection mode in the network. You can select between ISDN/X.21 or Ethernet.

ISDN Connection

The option 'ISDN/X.21' must be selected in the line for connection type if an ISDN connection is required.

ISDN Number

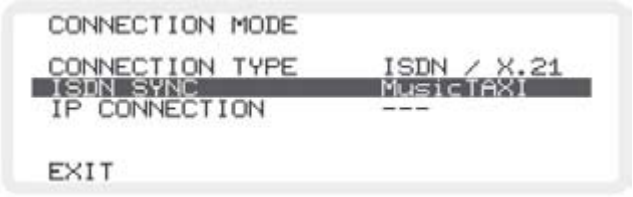
Depending on the number of ISDN modules, input fields between ISDN#1 and ISDN#4 are displayed.



Entries are made using the numerical keypad. These may have a maximum of 22 digits. Correct and erase entries using the DEL button and move between ISDN input fields using the 'Enter' button.

Note The ISDN Sync option is available once an ISDN number has been entered.

ISDN Sync



The 'ISDN Sync' menu serves for selecting the codec of your connection partner. The possible Sync modes are:

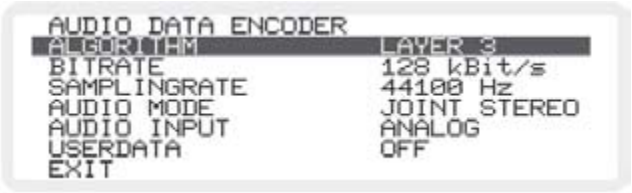
MusicTAXI (MusicTAXI Sync for 1 to 4 B-channels)
PRIMA (CCS Sync for 2 B-channels)
ZEPHYR (Telos Sync for 2 B-channels)
AETA (for 4SB ADPCM algorithm; optional)
NO SYNC when using 1 B-channel
NO SYNC (INV) when using 1 B-channel
AUTO - Automatic Audio Codec Detection

The release of the AETA sync and the 4SB ADPCM algorithm (not contained in the standard scope of delivery) takes place via the 'OC Remote' or 'NETControl' software and depends on the unit model and its serial number. Each unit receives a unique key code (pls. see page 20).

For information on the Zephyr, CDQ Prima and AETA Hifiscoop pre-settings please see the chapter 'Audio compatibility via ISDN' on the data medium included in the delivery scope.

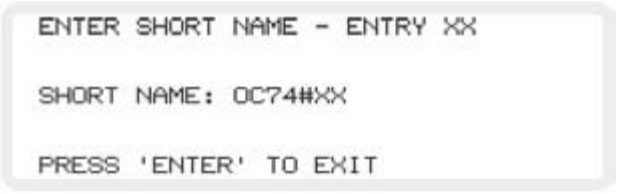
Audio Data Encoder

In this menu you can determine all audio parameters for the planned connection.



This menu leads you through settings for Algorithm (Layer II, Layer III, G.711, G.722 and optionally 4SB ADPCM), Bitrate and up to User Data. Do not forget to correctly define the audio input: AES/EBU for digital units in professional format, S/PDIF for digital units in consumer format, ANALOG for analog units. Leave the menu with 'Exit'.

Shortname



Once the ISDN number and audio parameters have been entered, a name with up 7 digits can be assigned to the recipient (see page 55).

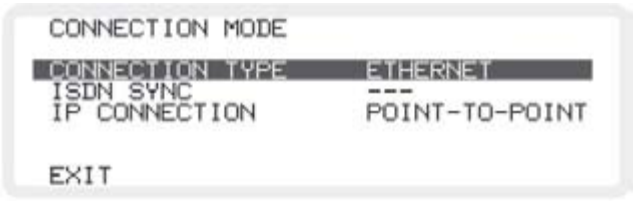
Using the digital keypad and the left-right arrow buttons enter the input. 'Enter' confirms your entry and exits this menu item.

Store & Exit

By pressing the 'Enter' button the settings made in the ISDN/IP directory are saved and the 'Data Input' menu item is exited.

IP Connection

Should an Ethernet connection be selected, you can then set the desired IP connection.



The following connenction modes are possible:

Point-to-Point

A bi-directional connection between two units. TCP is utilised as the protocol, possible transmission errors are corrected to a certain degree by this protocol. These entries are marked with an “X” in the Sync column of the directory.

Transmit

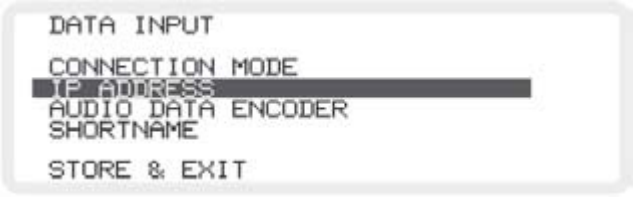
The unit functions as a transmitter for broadcast or multi-cast transmissions. UDP is utilised as the protocol, possible transmission errors can not be corrected. In this mode, the unit transmits to one or more receivers. Bidirectional UDP connections are possible when both units are set to TRANSMIT. Marked with “T” in the directory.

Receive

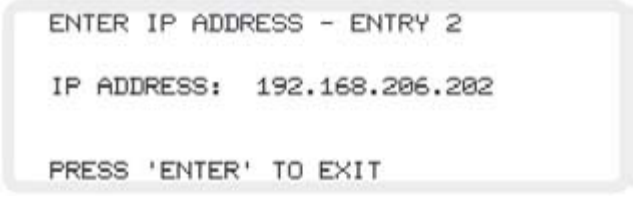
Here the unit functions as a receiver for broadcast or multicast transmissions. This setting is the opposite of TRANSMIT. Marked with “R” in the directory.

Return to the ‘Data Input’ menu item by using the ‘Exit’ feature.

IP Address



Changes in a connection result in the automatic alternation between the ISDN number entry and the IP address in the third line.



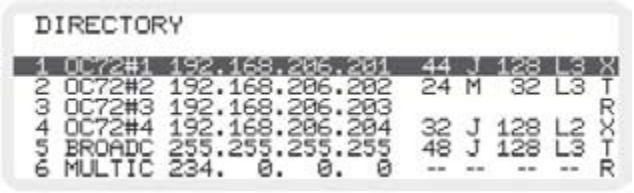
Here you enter the IP addresses for the desired connection. The addresses to be entered are dependent on the desired transmission protocol:

POINT-TO-POINT mode: The local IP address of the partner unit is to be entered.

For TRANSMIT and RECEIVE it is to be distinguished whether a broadcast or a multicast transmission is desired.

Broadcast A broadcast address must be entered for the unit set to TRANSMIT (for e.g. position #5 in the directory). The unit set to RECEIVE dials the address of the partner unit. This is the address of the unit set to TRANSMIT.

Multicast Here the same address has to be dialed from both the TRANSMIT and RECEIVE units. This has to be a multicast address found in the number range from 224.0.0.0 to 239.255.255.255 (for e.g. position #6 in the directory: 234.0.0.0)



Applications and further descriptions are found up to p. 28.

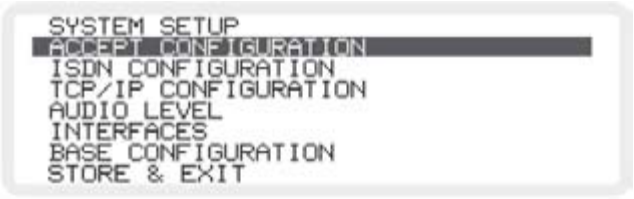
Audio Data Encoder Identical to the ISDN connections described, here the audio parameters for an intended connection can be specified.

Shortname Here the shortname of a partner audio codec can be entered with a maximum length of 7 characters for easier identification.

Store & Exit This feature stores the entries made in the ISDN/IP directory and exits the 'Data Input' menu item.

System Setup

By pressing the UP/DOWN buttons, select System Setup from the main menu and confirm with the 'Enter' button.



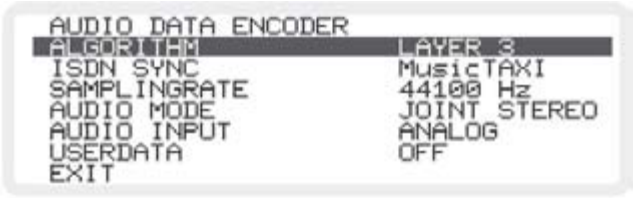
Accept Configuration

This sets up the call accept mode of the OPTICODEC. First you can set the accept mode Audio Data Encoder for the unit and transmission more or less specific and permanently. Then the unit only accepts calls in the respective configuration. Or you can select the operation mode AUTO (Automatic Codec Detection). Then the OPTICODEC serves as a 'slave' and takes over the parameters of the calling unit automatically.

The 'AUTO' mode is not available for 'Audio Input' and 'Userdata'.

Algorithm

The 'Algorithm' menu item serves for setting the desired data reduction procedure. You can select between:
Layer 2, Layer 3, 4SB ADPCM* (*optional) and
AUTO (G.711/G.722 calls are also accepted).



ISDN Sync

The 'ISDN Sync' menu serves for setting the desired synchronization procedure.

The possible Sync modes are:
MusicTAXI (MusicTAXI Sync for 1 to 4 B-channels)
PRIMA (CCS Sync for 2 B-channels)
ZEPHYR (Telos Sync for 2 B-channels)
AETA (for 4SB ADPCM algorithm; optional)
NO SYNC when using 1 B-channel
NO SYNC (INV) when using 1 B-channel
AUTO - Automatic Audio Codec Detection

The release of the AETA sync and the 4SB ADPCM algorithm (not contained in the standard scope of delivery) takes place via the 'OC Remote' or 'NETControl' software and depends on the unit model and its serial number. Each unit receives a unique key code.

Warning If a sync other than 'MusicTAXI' or 'AUTO' is preset, G.722 calls cannot be received.

Samplingrate The 'Samplingrate' menu item serves for setting the desired sampling frequency when calls are coming in. You can select between: 16, 22.05, 24, 32, 44.1, 48 kHz and AUTO (the sampling frequency of the calling unit is taken over).

Audio Mode The menu item 'Audio Mode' serves for setting the desired channel mode, when calls are coming in.
You can select between Mono, Dual Mono, Stereo, Joint Stereo and AUTO (pls. s. page 27).

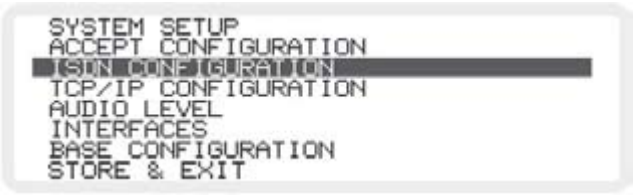
Audio Input The menu item 'Audio Input' serves for setting the desired audio input, when calls are coming in. You can select between: Analog, AES/EBU and S/PDIF.

Userdata The menu item 'Userdata' serves for setting the desired ancillary data, when calls are coming in.
You can select between:
OFF (no ancillary data are transmitted)
1200, 2400, 4800 baud in Layer 2
1200, 2400, 4800, 9600 baud in Layer 3.

Note If the transmission of ancillary data is switched off (OFF), the alarm control signals are not transmitted either.

From OPTICODEC to OPTICODEC, the lowest preset baud rate of the ancillary data is agreed within the unit handshake.

ISDN Configuration



ISDN Protocol

The OPTICODEC has several ISDN D-channel protocols. Please make sure that you have selected the correct protocol. Decisive is the ISDN protocol of your connection, not the one of the partner unit! Alter the settings by pressing the 'Enter' key.

ISDN Interface

In this menu option the S_0 and U interfaces to be used for the transmission are selected. The function is only available if IMD4 modules are installed in the OPTICODEC. Possible settings are:
S_0 PMP (Point-to-Multipoint), S_0 PP (Point-to-Point) and U PMP (Point-to-Multipoint) (pls. see page 42.)

Local Numbers

The ISDN numbers which are entered here, are sent to the ISDN network when the connection has been established. On certain ISDN networks [e.g. Private Branch Exchange (PBX)*] the extension number has to be entered.

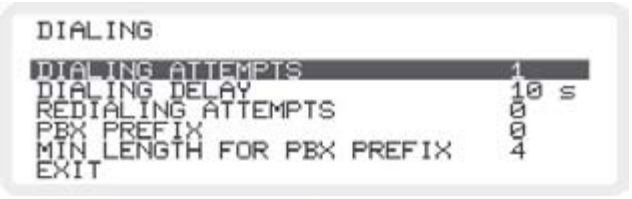
	S_0 without PBX*	S_0 on PBX*
1 x unit only	can remain vacant or ISDN number without area code	can remain vacant or only the No. of your extension
n x units	ISDN number without area code and MSN Check activated	only the No. of your extension and MSN Check activated (Test Called Number)

Note Should a local number be required, then all entry fields have to be occupied.

SPID Numbers

The SPID numbers entered here are also sent when a connection is being established. This is necessary only when operating on USA or Canadian networks.
The identification number input and allocation takes places as described in "Local Numbers".

Dialing



Dialing Attempts

Here the number of dialing attempts between 1 and 5 can be selected.

Dialing Delay

This menu items serves for setting the desired time between dialing attempts (between 10 and 60 seconds).

Redialing Attempts

If an existing connection is interrupted not by the dialing OPTICODEC, but by possible ISDN problems, then here you can define the number of redialing attempts between 0 and 5.

PBX Prefix

Under certain conditions (e.g. private branch exchange PBX), a number that prefixes the ISDN number for dial-up via ISDN can be entered here. To make an outside call from a telephone system, for instance, enter 0.

A preselection number can also be entered here. The number max not exceed five digits.

Min. length for PBX Prefix

Using the 'Min. length for PBX Prefix' menu option, define the minimum number of digits an ISDN number must have to allow this prefix to be set before the number.

If, for example, internal extension numbers have three digits, a 4 should be entered here.

To continue to enable internal calls, PBX dialling codes for ISDN numbers with less than four digits are ignored.

Incoming Calls

The menu item 'Incoming Calls' defines the behavior of the OPTICODEC during operation on a S_0 connection together with other units.

Accept Telephone Calls

First set 'Accept Telephone Calls' to:

ALWAYS	every telephone call is accepted
NEVER	all telephone calls are rejected
ASK	manual confirmation of each call is requested by the unit.

Accept MPEG/G.722 Calls

With the menu item 'Accept MPEG/G.722 Calls' the behavior for incoming MPEG/G.722 calls is determined. The setting options are described above.

Test Called Number

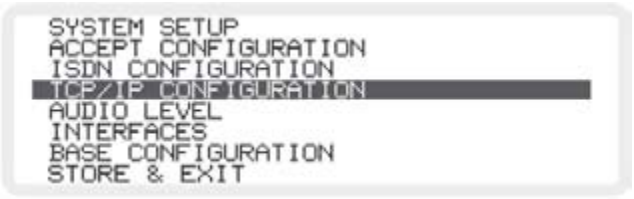
The 'Test Called Number' menu option activates the MSN query for incoming calls. This requires the correct MSNs of the individual connection to be entered into the 'Local Numbers' menu item. The call is only accepted if the two numbers are identical. On Euro-ISDN, the MSN is usually the ISDN number of the connection without the dialling code, but for PBXs it is usually the extension number only. The 'YES' option should only be activated if, in addition to the OPTICODEC, other devices (e.g. a telephone, fax machine, PC card) must also be operated on the same ISDN connection.

Number Prefix (for incoming calls)

These settings concern incoming calls for OC. This setting is required only for those ISDN systems that do not automatically add the ISDN number. The minimum number length applies here too. For direct S0 connections with Euro-ISDN, the leading zeros in the ISDN numbers are not transferred for incoming calls, e.g. 7141226622. This can be corrected by means of the following entries.

If a 0 is entered for national calls, this is added here. The same applies for international calls, where 00 is to be entered in Germany. When these digits are entered, the ISDN number required to make the call will actually be displayed.

TCP/IP Configuration



TCP (Transmission Control Protocol) is one of the most important protocol specifications of the network protocols. TCP is a connection-oriented protocol and provides a reliable, byte stream service.

This menu item determines the basic settings of the OPTICODEC for operation in the network. The settings are subdivided into three areas:

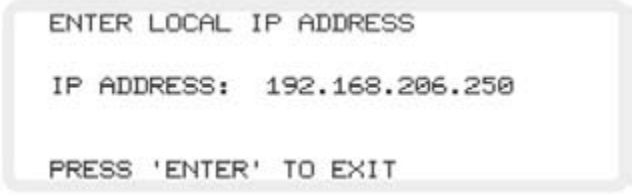
General Settings
- LOCAL IP ADDRESS
- SUBNET MASK
- DEFAULT GATEWAY

Settings for Remote Control
- REMOTE CONTROL

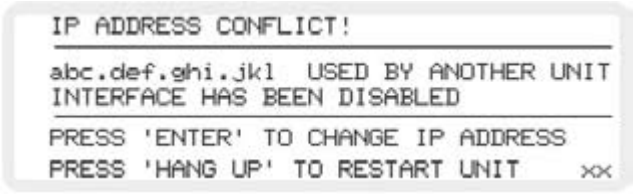
Settings for Audio Transmission
- AUDIO TRANSMISSION

Local IP Address

Enter the IP address of your OPTICODEC into the input mask. Please note that each connection in the network requires a separate and unique IP address.



Should an address be allocated twice, the following error message appears:

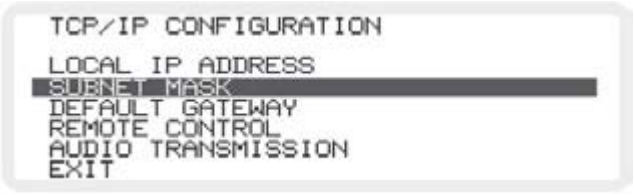


abc.def.ghi.jkl is the own IP address which is currently set and **xx** is a counter which displays the seconds to go before the automatic restart.

With 'Enter', the menu to enter the local IP address appears. After entering the address, the unit is restarted. With 'Hang Up' the unit restarts without changing the IP address.

The unit restarts automatically after 60 seconds should no button be operated. The IP address will not be changed.

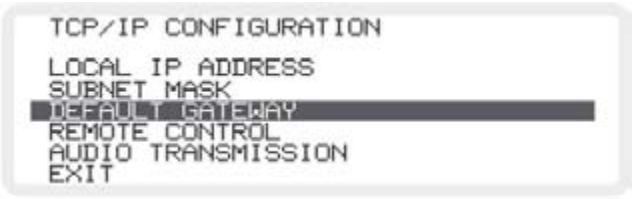
Subnet Mask



The 'Subnet Mask' is utilised to divide the network into sub-networks and herewith splits the amount of data exchange into several channels.

The Subnet mask is, just as the IP addresses, a binary 32-bit value and is provided by your network administrator. The number 255.255.255.0 is normally entered for Class C networks.

Default Gateway



The data exchange between the different cross points of the network is transparent for the user. The IP-stack recognizes whether a data packet is scheduled for another network and will then address the default gateway. This corresponds for e.g. with a router or other gateway units. 0.0.0.0 must be entered if the default gateway should not be used.

Warning Only when using the NETControl software:
Should the Local IP Address and/or Subnet Mask be changed so that the unit and the PC running the NETControl program are then situated in different networks, then this PC no longer has access to the unit.

You will be informed of the IP Address, Subnet Mask and Default Gateway by your network administrator.

Remote Control

The settings for the remote control of the unit over the network are found in the menu item 'Remote Control'. Enter the name of your OPTICODEC and the port numbers here.

Name

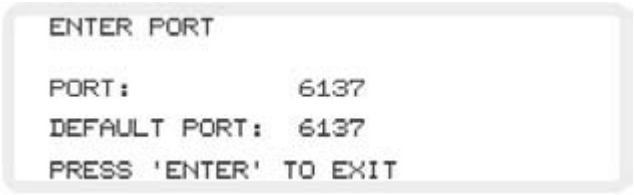
This is for the easier identification of units within the network. Enter the name of your OPTICODEC with a maximum of 7 digits. This name is conveyed to the remote control program (for e.g. NETControl) and is displayed in its list of units.

When the name of a unit has been changed and confirmed with 'OK', the unit will disappear from the unit list in the remote control program for several seconds. The unit reappears under the new name.

Port

An important part of the TCP/IP model are the port numbers, also known as socket numbers. With these ports, it is advised which service is desired (pls. s. 'Port' on page 38).

The value 6137 should always be entered for the OPTICODEC.

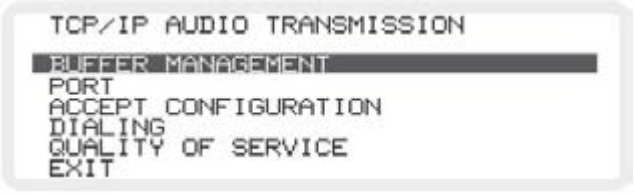


Auto Detect

This function is for the automatic recognition of units using a control software (for e.g. NETControl) and can only be used in a local area network. This function should remain disabled to control units outside of the network area

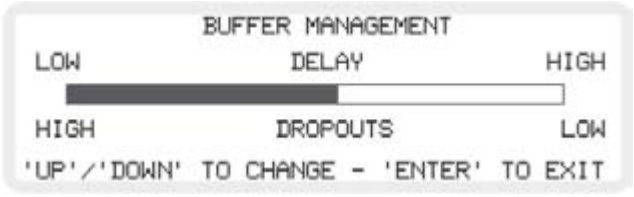
Audio Transmission

The settings for audio transmission over the network are found in this menu.



Buffer Management

This buffer serves as a bridge for short-term interruptions during transmission. The size of the buffer (which stores the audio data) can be influenced.

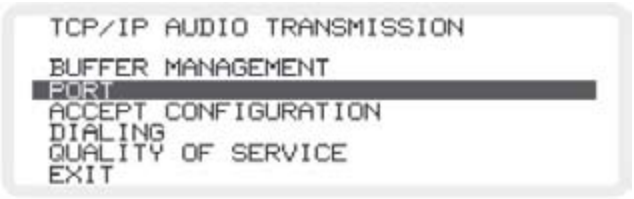


For the most reliable transmission, the maximum value (bar to the far right) should be set. This results, however, in a greater delay.

The bar can be adjusted further to the left should a lower delay be important but this negatively influences the transmission reliability.

To achieve the highest possible transmission reliability with a low delay, it should be ensured that no further units are simultaneous transmitting data within the network.

Port



Here the port number for audio transmission is entered. Always enter the value 6136 for the OPTICODEC.

Accept Configuration Audio Data Encoder

This encoder configuration is taken over when the OPTICODEC is called by another OPTICODEC in the mode Point-to-Point. It may be possible to use: For Tx Layer 2, 384 kbps, 48 kHz, dual mono; for Rx Layer 3, 32 kbps, 16 kHz, mono. As opposed to the corresponding menu to call via ISDN, here no automation is possible.

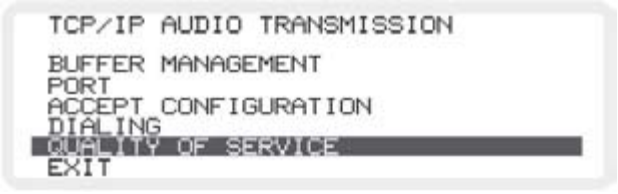
Dialing

Dialing Attempts
This menu item serves for setting the desired dialing attempts. You can select between 1 ... 5 and INFINITE.

Dialing Delay
This menu items serves for setting the desired time between dialing attempts (between 10 and 360 seconds).

Redialing Attempts
This menu item serves for setting the desired redialing attempts, if a connection had not been disconnected by the calling OPTICODEC. You can select between 0 ... 9 and INFINITE.

Quality of Service



Not all data transmission applications have the same priority and not all of these require the same high standards for the transfer of data. In order to minimize or avoid the risk of data network congestion, a so-called „Quality of Service" of QoS option has been implemented in the IP header with acknowledgement fields such as Time to Live, Protocol and Header Checksum.

Type

QoS (when the router has been configured accordingly) actively regulates traffic in the net and utilises the available bandwidth both intelligently and effectively on the basis of data priority and bandwidth reservation.

TOS

TOS (Type of Service) or DiffServ (Differentiated Service Architecture) are the key mechanisms of QoS and are responsible for the assessment of packet priority.

The TOS bits contain information on the ways and means of how a datagramm should be handled by a router. An overloaded router can, for example, on the basis of the TOS field determine which packets are less important (and can therefore be cancelled) and which packets must essentially be forwarded.

Precedence Values

Precedence	Significance	Precedence	Significance
000	Normal	011	Flash
010	Priority	100	Flash Override
010	Immediate	101	Critical

TOS Values

TOS	Significance	TOS	Significance
0000	Normal	0010	max. Reliability
1000	min. Delay	0001	min. Monetary Cost
0100	max. Throughtput		

DiffServ

DiffServ utilises a new definition of the IPv4 TOS header field and the IPv6 traffic class header field. The objective of DiffServ is the subdivision of data traffic into service classes of different priorities without using costly signaling on each router. Each packet can be labelled and then handled and transmitted according to its labelling.

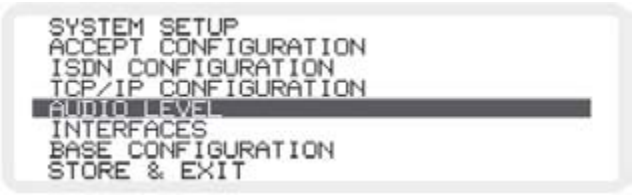
DiffServ Codepoints (DSCP)

Each Per-Hop-Behavior (PHB) stream is determined by a DSCP. You can select between: Default („Best Effort"), Class Selector (1-7), Assured Forwarding (11-13, 21-23, 31-33, 41-43) und Expedited Forwarding.

Note

Further details and specifications can be found under the „Request of Comments" lists (RFC1349 TOS; RFC2474 DiffServ) available online in Internet (www.rfc-editor.org) and accessible for all users.

Audio Levels



Level Range

This menu item allows the adjustment of the level range: 50 or 80 dB.

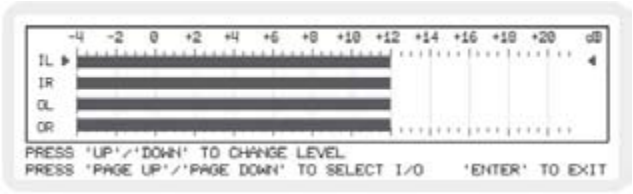
Headroom

This menu item serves for setting the desired headroom. You can select between 0 and 20 dB steps. Ex-factory the setting is 0 dB. The scale display in the online menu is moved.

Warning	Clipping limit is at 0 dB + selected headroom!

Adjust I/O Levels

This menu item serves for setting the analog INPUT and OUTPUT level for the left and right channels. Ex-factory the levels are set at +12 dBu, the headroom is 0 dB.

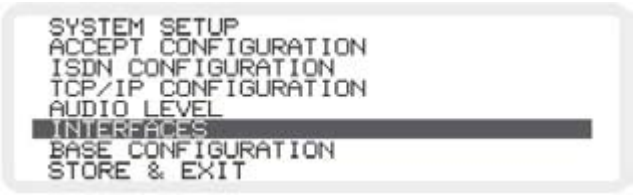


This means: input level = output level = 12 dBu.

PgUp and PgDn selects the respective channels. With the UP and DOWN keys the respective level values are adjusted in 0.5 dB steps.

Confirm your settings with 'Enter'.

Interfaces



External Sync Input

The OPTICODEC has a sample rate converter at the audio input and output.

For the external SYNChronization of the digital output you can select between:

DISABLED Word clock is generated from the transmission clock

DIGITAL IN Word clock is generated from the AES or S/PDIF input signal

SYNC IN Word clock is taken from the SYNC IN

Alarm Signals

Should the signals be switched off, the Alarm/Control Interface will behave as described on page #14. Otherwise you can select between:

CON The signal is set at Pin 19, as soon asthe decoder is SYNChronized – i.e. when the connection is 'OK'.

DIS The signal is set at pin 18, if the line had been disconnected from the partner unit or due to an ISDN failure

CON+DIS Both signals are set.

Backup Settings

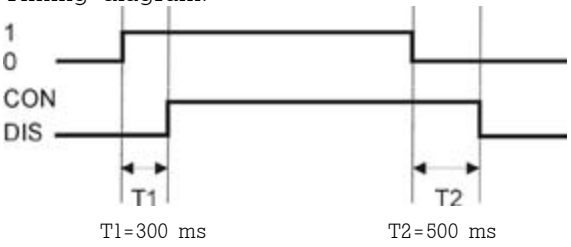
An entry from the ISDN Directory can be allocated to each input of the Alarm/Control Interface in the backup settings.

This is done by selecting the respective input with the cursor and confirming with the 'Enter' button. A square cursor now blinks and a number can be entered using the digital keypad.

This number corresponds directly in all parameters with the entry in the ISDN directory. After entering the number, you have to confirm your setting by pressing the 'Enter' button. If you enter only one digit for the number, the OPTICODEC will automatically add a 0 before the digit.

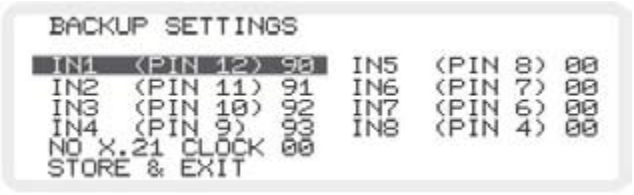
Entering '00' means you can only use this port for transparent contact closure information (on/off), not for ISDN calls.

Timing diagram:



If the length of the switching signal is less than T1 or T2, the signal is ignored.

In the following example the alarm/control ports IN1 to IN4 correspond to the entries 90 to 93 of the ISDN directory.

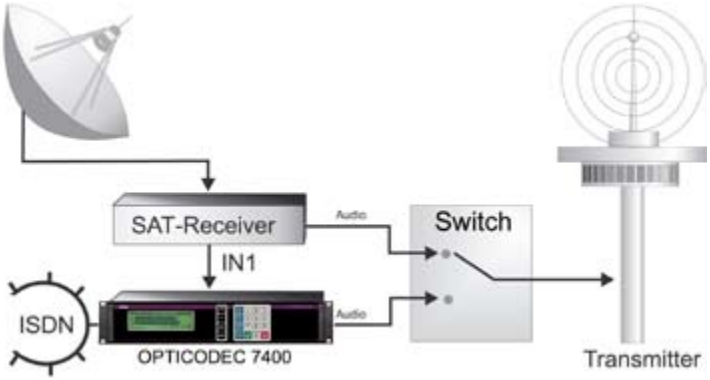


The ports IN5 to IN8 are configured with 00 and can be used for transparent switching information.

A confirming signal of whether a connection has been established, takes places over the corresponding outputs of the Alarm/Control Interface. By using IN2 for establishing a connection, OUT2 (pin 23) will confirm the connection as soon as the decoder is synchronized.

The inputs must be always confirmed with 'Store & Exit'.

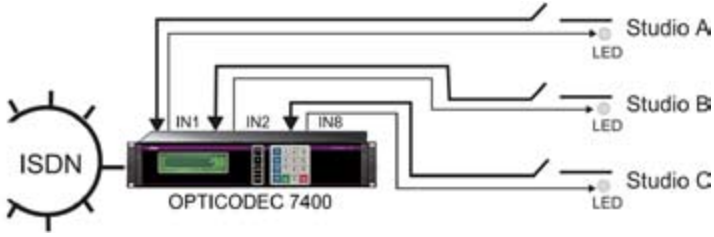
Applications by Using Backup Settings:
Satellite/ISDN Redundcy



Assuming the satellite receiver can indicate an opto-decoupled error message, you can connect this information to the alarm/control interface. If the error message is ON, the OPTICODEC will automatically establish an ISDN connection to the relevant entry number. If the error message signal is OFF, the OPTICODEC will disconnect an existing ISDN connection.

'Panic Dial'

Up to 8 individually configured connection partners can be called by using switches. The audio parameters and connection relevant information are programmed in the 'Data Input' menu. A LED connected to the corresponding OUTPUT of the alarm/control interface will light up indicating that an ISDN connection has been established and that the decoder is in SYNC.



If the switch has been opened, the ISDN connection will be disconnected.

Automatic Connection Start

When switching on the unit or for e.g. after a power failure, the OPTICODEC automatically begins establishing a connection provided the following has been set up in the ISDN telephone directory:

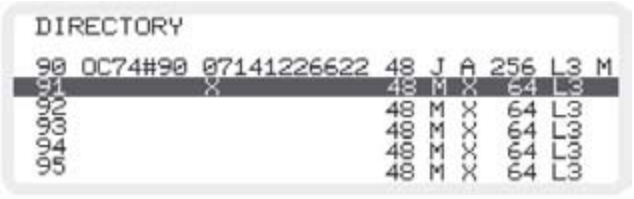
Select 'Data Input' in the main menu and confirm using the 'Enter' button. The input mask of the ISDN directory appears.

Under entry number 96, enter an "X", an ISDN number or an IP address and AUTOCON as the name (SHORTNAME). Also set up the desired configuration under AUDIO DATA ENCODER. Confirm your entry with EXIT using the 'Enter' button.

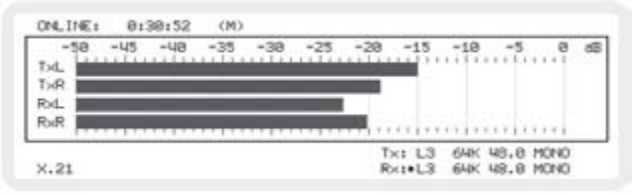
X.21 Clock Monitoring

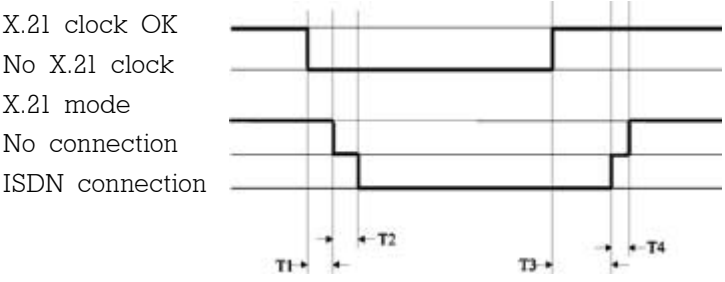
When operating the OPTICODEC via X.21 on a satellite modem or leased line, you can configure the OPTICODEC in such a way that the unit will establish an ISDN connection should the X.21 clock fail.

This is done by entering the ISDN position number of the partner unit to be dialled in case of a failure. Enter the number in the line "NO X.21 CLOCK" in the backup settings. These position numbers are listed in the ISDN directory. The desired configuration must also be defined.
Enter "X" instead of an ISDN number (using the 'Quick Dial' button) in any one of the empty fields of the ISDN directory.



Save your entry with 'Store & Exit' and leave this menu item. As soon as the X.21 clock is active again, the ISDN connection is disconnected and the unit returns to the X.21 mode.





T1: Time, how long the X.21 mode must fail before the ISDN connection is established.

T2: Length of time for an ISDN connection to be established.

T3: Time, how long the X.21 clock must again be active before the ISDN connection is again disconnected.

T4: Length of time for ISDN disconnection and change into X.21 mode.

Times:	T1	T2	T3	T4
(sec.)	2	5-30	5	1-2

When using OC Remote with the OPTICODEC 7400, please observe the following:

Backup IN1 replaces entry	87 in the no. list.
Backup IN2	88
Backup IN3	89
Backup IN4	90
Backup IN5	91
Backup IN6	92
Backup IN7	93
Backup IN8	94
No X.21 clock	95
X.21 autostart	96

Backlight This function serves to set the display background lighting of the connected unit:

ALWAYS ON background lighting is always on

ON CONNECT the background lighting switches on once a connection has been established or when the 'System Setup' or 'Data Input' menus have been called up. The lighting switches off shortly after returning to the main menu.

Base Configuration In this menu option all previously entered configurations are reset to the ex-factory settings (Reset Configuration). All ISDN/IP directory entries are also deleted (Delete Database).

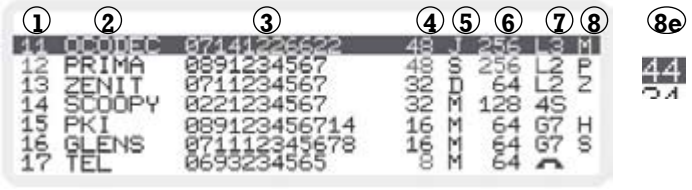
Warning This process can not be reversed after confirmation!

After the safety query confirm the deletion procedure with the DEL button or press 'Hang Up' to cancel.

Connect

The respective connection can be established quickly and easily. Select 'Connect' from the main menu and press 'Enter' to confirm. The directory for IP addresses and ISDN numbers with 96 entries appears.
For connection establishment you can decide between a connection via the ISDN/IP directory, quick dialing or manual input with the numeric keypad.

Explanation of the Display Lettering



1 Entry position number in directory;
2 Shortname;
3 ISDN Number or IP Address;
4 Set Samplingrate;
5 Audio Modes: M=Mono, D=Dual Mono, S=Stereo, J=Joint Stereo;
6 Set Bitrate;
7 Algorithm: L3=Layer 3, L2=Layer 2 4S=4SB ADPCM, G7=G.722, Telephone receiver icon=G.711;
8 ISDN Sync: M=MusicTAXI, P=Prima, Z=Zephyr, H=H.221, S=SRT, A=Auto;
8e Types of IP connections: X=Point-to-Point, T=Transmit, R=Receive

Establishing a Connection Using the ISDN/IP Directory

Each entry displays the abbreviated name of your connection partner, the IP address, the ISDN number, the selected audio parameters as well as the set connection type.

ISDN Connection

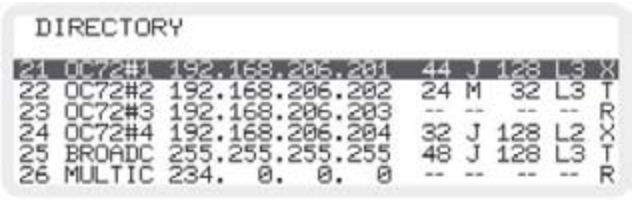
Select 'Connect' from the main menu and press 'Enter' to confirm. Select a connenction partner from the ISDN Directory and press 'Enter' again to confirm.

The OPTICODEC informs you permanently on the present transactions.

After successful synchronization, your OPTICODEC displays the message 'ISDN OK' and goes to the online menu.

If the connection is rejected, the OPTICODEC displays ERR(OR) and the reason for rejection.
Check the error reports using the error codes listed in the appendix, starting page 83.

IP Connection



As mentioned before, for TRANSMIT and RECEIVE it is to be distinguished whether a broadcast or a multicast transmission is desired. Select your connection partner from the list.

The connection is now being established. After a brief initialising sequence, the online menu of the OPTICODEC appears.

After successful synchronization (only in Point-to-Point mode) your OPTICODEC displays the message 'SYNC OK' and goes to the online menu. If the connection is rejected, the report 'CALL REJECTED' and the reason for the rejection are displayed.

In the UDP mode this is different: this connectionless, datagram-oriented protocol sends the datagrams together with the destination addresses to the network, but there is no guarantee that they will ever reach their destination, this is why the online menu appears immediately. Before starting data transmission the connection partners must select the correct setting for TRANSMIT/RECEIVE. The desired application and type of protocol must also be determined.

Establishing a Connection Using the Quick Dial Key

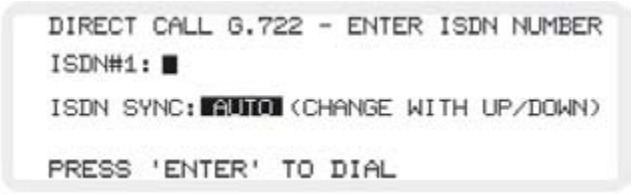
The 96 entries can be selected via quick dial assignments. Press the 'Quick Dial' key.

SELECT DESTINAT

The menu interrogates the entry number of your connection partner (from 01 to 96). Dialing takes place automatically with your previously adjusted parameters.

Establishing a Connection Using the Direct Dial Keys

First you have to determine the transmission mode. Via keypad you select between G.711 (3.1 kHz, telephone), G.722 (7kHz, H.221/SRT), Layer 2 and Layer 3.



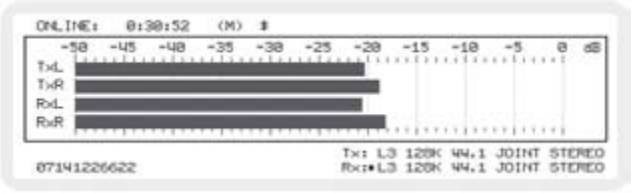
The input menu asks for the ISDN number to be entered using the numeric keypad as usual. Dialing is initiated by pressing the 'Enter' key.

Note

The connection parameters are determined as follows:
When entering only one ISDN number: 64 kbps, 48 kHz, mono, user data 1200 baud.
When entering two ISDN numbers: 128 kbps, 48 kHz, Joint Stereo, user data 1200 baud.
The audio input is taken from the 'Accept Configuration'. The used ISDN Sync is always 'AUTO'. You can select between AUTO, H.221 and SRT for the G.722 mode.

Connection Monitoring

You can easily monitor your audio transmission. After a connection has been established and the audio parameters have been exchanged, the online transmission menu is displayed.



It informs you of the send and receive levels, connection time as well as the set headroom. In addition to the transmit (Tx) and receive (Rx) configurations, the IP address or ISDN number of your connection partner is displayed.

Currency Icon

Once an ISDN connection has been established, not only the connect time but also the $ icon for connection charges is displayed. The actual connection charges can only be displayed on an ISDN line of the German Telecom after being respectively activated.

Sync Icon

The Sync symbol in the Rx path confirms that the decoder of your connection partner receives the correct data. The Sync symbol only appears for connections between OPTICODECs 7200/7400 and only for Point-to-Point and ISDN connections in Layer 2 and Layer 3. During connections to other units or with other algorithms as well as during Broadcast/Multicast connections, this symbol is missing.

X.21 Connection Establishment

From the telephone directory select an entry with "X" as the ISDN number.

Codec Loop Connection Establishment

Select an entry without an ISDN number from the telephone directory. The connection is established either via telephone directory or quick dial.

Connect Menu

If the 'Enter' key is pressed during a connection, the Connect Menu is displayed without line disconnection.
It provides the following possibilities:

PREVIOUS MENU	return to former display
AUDIO DATA ENCODER	alteration of audio parameters and audio inputs
ADJUST I/O LEVEL	alteration of INPUT/OUTPUT level actuator
DISCONNECT	disconnection

Terminating a Connection

A Point-to-Point connection is ended by double-pressing the "Hang Up" button. Your connection partner sees the message: REMOTE DISCONNECT.

In the broadcast and multicast modes all connection partners, transmitters and receivers have to press the "Hang Up" button to disconnect the link. The 'Hang Up' button must be pressed again within 10 seconds (while the 'Hang Up' LED flashes), otherwise the command to disconnect will be ignored.

After disconnection the unit returns to the standby mode, awaiting the next connection command or incoming calls. If the OPTICODEC is called, it adapts itself automatically to the audio configuration of the calling unit. It does not matter whether the call is coming from a GSM mobile, a callbox or from a studio. The OPTICODEC reacts fully automatic and guarantees audio transmission.

In the online menus of the OC Remote software and OPTICODEC 7400 the following messages may be displayed:

Status Messages	Possible Cause
· NO X.21 CLOCK	No X.21 clock was determined.
· ILLEGAL X.21 CLK	The measured X.21 clock does not correspond to a ISO data rate.
· NO INPUT SIGNAL	The AES or SPDIF input has been set and there is no signal at the selected input.
· DSP TIMEOUT	On access to the DSPs there is no confirmation message.
· ISDN PIPELINE OVERFLOW	ISDN operation is not possible.
· REMOTE PIPELINE OWERFLOW	The remote port does not respond.

Number Codes

When the OPTICODEC is in standby mode, you can select from the main menu the following functions by entering certain number codes:

Audio Test (8+8+8+8+8)

Audio loop without encoder/decoder.
By pressing the 'Enter' key you can change the audio input to AES/EBU or S/PDIF. By pressing 1, 2 or 3 you can change the sampling frequency.
By pressing HANG up, you leave the audio test.

LED Test (1+2+3)

By simultaneous operation of the keys 1+2+3 all LEDs on the keypad light up.

9+9+9+9+9

Interrogation of the OC 7400 software versions.

Reset (3+6+9)

By pressing 3+6+9 simultaneously, reset will be started.

Error message	Possible causes	Checkpoint/ workaround
· ISDN NOT RESPONDING	The OPTICODEC could not establish a communication to the ISDN connection: · ISDN cable not connected. · Faulty ISDN cable. · ISDN connection not in operation. · Both B-channels are already being used by other devices on this connection.	· Check the ISDN connection and the cable, and try again.
· CHANNEL UNACCEPTABLE · CALL IN AN ESTABLISHED CHANNEL · USER BUSY · NON-SELECTED USER CLEARING · RESPONSE TO STATUS INQUIRY	The OPTICODEC could not establish a connection to the entered number: · The remote device already has a connection („busy“). · The ISDN number is incorrect.	· Check the entered ISDN number and/ or retry later.
· UNALLOCATED NUMBER · NO ROUTE TO SPECIFIED NETWORK · NO ROUTE TO DESTINATION · NUMBER CHANGED · DESTINATION OUT OF ORDER · INVALID NUMBER FORMAT · FACILITY REJECTED	The OPTICODEC could not establish a connection to the entered ISDN number: · The ISDN number is incorrect or does not exist.	· Check the entered ISDN number and try again.
· NORMAL CALL CLEARING · NO USER RESPONDING · NO ANSWER FROM USER · CALL REJECTED · NORMAL, UNSPECIFIED	The OPTICODEC could not establish a connection to the entered ISDN number: · The ISDN number is incorrect or does not exist. · The addressed remote device is not switched on or is not connected.	· Check the ISDN number and try again. · Check the status of the remote device and correct if necessary.

Error message	Possible causes	Checkpoint/ workaround
· NO CHANNEL AVAILABLE · NETWORK OUT OF ORDER · TEMPORARY FAILURE · SWITCHING EQUIPMENT CONGESTION · ACCESS INFORMATION DISCARDED · CHANNEL NOT AVAILABLE · RESOURCES UNAVAILABLE	The cause is attributable to the ISDN, i.e. it is not possible for the ISDN network to establish the desired connection at the present time. · No B-channels are currently free, since they are being used at the moment by other devices on this connection. · The ISDN network is overloaded.	· Try again later.
· INTER. NETWORKING, UNSPECIFIED	This error message appears when switching between ISDN networks of different providers, e.g. from a private provider to Deutsche Telekom or on foreign connections.	· Try again later.
· INTERNAL TIMEOUT	A timeout occurred in the device while establishing the connection.	· Check the ISDN connection, cable, numbers and protocol.
· QUALITY OF SERVICE UNAVAILABLE · REQUESTED FACILITY NOT SUBSCRIBED · BEARER CAPABILITY NOT AUTHORIZED · BEARER CAPABILITY NOT AVAILABLE · SERVICE OR OPTION NOT AVAILABLE · BEARER CAPABILITY NOT IMPLEMENTED · CHANNEL TYPE NOT IMPLEMENTED · REQUESTED FACILITY NOT IMPLEMENTED · ONLY RESTICTED DIG. INFO AVAILABLE · SERVICE OR OPTION NOT IMPLEMENTED	These error messages mean that a function required by the OPTICODEC is not supported by the ISDN network. Additional redial attempts will result in the same error. · The set ISDN protocol is incorrect.	· Check the ISDN protocol. If it is set correctly, then you should establish a test connection in telephone mode to check the activated services. If a connection can now be established, then the service „Data Transfer“ is not activated on the ISDN connection of the dialing OPTICODEC. The service must be activated by your provider.

Error message	Possible causes	Checkpoint/ workaround
· INVALID CALL REFERENCE VALUE · IDENTIFIED CHANNEL DOES NOT EXIST · CALL IDENTITY IN USE · INCOMPATIBLE DESTINATION · DEST. ADDRESS MISSING INCOMPLETE · INVALID TRANSIT NETWORK SELECTION · INVALID MESSAGE, UNSPECIFIED · MANDATORY ELEMENT MISSING · MESSAGE TYPE NOT IMPLEMENTED · ILLEGAL MESSAGE · INFORM. ELEMENT NOT IMPLEMENTED · INVALID INFORMATION ELEMENT · MESSAGE INCOMPATIBLE TO CALL STATE · RECOVERY ON TIMER EXPIRY · PROTOCOL ERROR, UNSPECIFIED	These error messages are generally caused by an incorrectly set ISDN protocol.	· Check the set ISDN protocol and try again.
· " --- " ONLY FOR US PROTOCOLS	The ISDN network did not report any error. The OC may possibly have terminated the corresponding B-channel itself or it was terminated by the remote device.	· Check the set ISDN protocol and try again.
· SPID REQUEST PENDING	The querying of the SPID numbers for ISDN has not yet been answered.	· Check the SPID number and connection.
· SPID FAILED	The SPID was rejected by the ISDN.	· Check the SPID number and connection.
· ILLEGAL SPID	The SPID number entered is too short.	
· SPID MISSING	A US protocol was set, but no SPID number was entered.	· Enter the SPID and try again.

Standardised Audio Compression Procedures (Algorithms)	
· G.711	Standardised audio compression procedure for speech transmissions over ISDN. This algorithm requires 64 kbps bandwidth and supplies audio quality of up to 3.1 kHz ("telephone").
· G.722	This algorithm requires a data rate of 64 kbps and supplies audio quality of up to 7 kHz („radio quality"). With G.722, two synchronisation modes are available: SRT and H.221.
· 4SB ADPCM	requires a data rate of 128 to 256 kbps (128 kbps per audio channel) and supplies audio bandwidth of up to 15 kHz. Low delay over ISDN: ‹ 6 ms.
· MPEG Layer 2	Data rate 32 - 384 kbps, sampling rate up to 48 kHz* and supplies up to 20 kHz audio bandwidth.
· MPEG Layer 3	Data rate 8 - 320 kbps, sampling rate up to 48 kHz* and supplies up to 20 kHz audio bandwidth.
*Delay and audio bandwidth are strongly dependent on the sampling rate and data rate.	

Error message	**Possible causes**
· NETWORK IS DOWN	Device not connected to the network.
· NETWORK IS UNREACHABLE	Local IP address has duplicate allocation.
· HOST IS UNREACHABLE	The desired IP address cannot be reached.
· NETWORK RESET	Error on the network.
· CONNECTION RESET BY PEER	The remote device has terminated the connection.
· CONNECTION TIMED OUT	The remote device is not reachable.
· CONNECTION REFUSED	The connection was refused.
· HOST IS DOWN	The desired IP address cannot be reached at the current time.

Mechanic
Size: 19", (2U 7400 and 1U 7200), depth: 380 mm,
temper.: -10 °C ... +45 ° C, no fan necessary,
relative humidity: 30 ... 90 %,
Line voltage: 100 ... 240 V AC, 50/60 Hz, 0.375 ... 0.20 A,
max. 25 VA, weight approx. 6 kg.

Algorithms
ISO/MPEG 11172-3 Layer II, ISO/MPEG 11172-3 Layer 3
(licenced from Fraunhofer IIS and Thomson),
4SB ADPCM (licenced from France Telecom),
G.722 with H.221 and SRT, G.711.

Audio Modes
Mono, Dual Mono, Stereo, Joint Stereo.

Transmission Rates
Ethernet: 32 ... 384 kbps
ISDN: n x 64 kbps (n= 1 ... 4),
X.21: 8 ... 384 kbps

Sampling Frequencies
16, 22.05, 24, 32, 44.1, 48 kHz.

Ancillary Data
0, 1200 - 9600 baud.

PC Remote Control
RS232/RS422 with 9600 baud, all functions can be operated remotely. Software download

X.21 Interface
Rx and Tx for 8 to 384 kbps

Sync Modes
Bonding for OPTICODEC, channel splitting with 2 ISDN B-channels for Zephyr, CCS Sync with 2 ISDN B-channels for CDQPRIMA and CDQ2000, G.722/H.221 for AVT 7 kHz telephone, G.722/SRT for 7 kHz Glensound and 7 kHz CCS and 7 kHz Zephyr.

Audio Interfaces
Digital: AES/EBU according to IEC 958 professional format, S/PDIF according to IEC 958 consumer format, external clocking, sample rate converter at input and output.
Analog input: 24 bits, adjustable level range from -4 to +21 dBu, impedance ≧ 10 kOhms / 600 Ohms, asymmetric attenuation (common mode rejection) ≧ 66 dB
Analog output: 24 bits, adjustable level range from -4 to +21 dBu, impedance ≦ 50 Ohms, asymmetric voltage attenuation ≧ 40 dB according to IEC 268-2.

Frequency Response
20 Hz - 20 kHz, +0.5/-1 dB.
Signal-to-Noise Ratio
weighted: ≧ 80 dB, unweighted: ≧ 85 dB.
Distortion (THD+N)
(with a 20 kHz filter, to 5 kHz) at maximum level ≦0.06%
Crosstalk Attenuation
(ratio) at 1 kHz ›100 dB.
Phase Error
≦ 1,5 degrees.

All technical information may be subject to change without notice.

Delivery Scope

OPTICODEC 7400 unit (incl. power supply cable, length: 2m)
ISDN cable (RJ45 type CAT5), length: 2 m)**
Ethernet network cable (RJ45 type CAT5), length: 2 m)*
PC connection cable (type: KB003, serial 9pole cable)
user manual+CD-ROM: OC PC Remote and NETControl software

Versions

Order No.	Description: Full duplex audio codec
OC7400/E/NET128	(basic unit) with 1 x S_0 and 1 x 10Base-T
OC7400/E/NET256	with 2 x S_0 and 1 x 10Base-T
OC7400/E/NET	with 10Base-T
OC7400/E/128	with 1 x S_0
OC7400/E/256	with 2 x S_0
OC7400/E/384	with 3 x S_0
OC7400/X.21	without 10Base-T and S_0 interfaces

Delivery Scope

OPTICODEC 7200 unit (incl. power supply cable, length: 2m)
ISDN cable (RJ45 type CAT5), length:2 m)**
PC connection cable (type: KB003, serial 9pole cable)
user manual+ CD-ROM with OC PC Remote software
*=only for units with 10Base-T interface; **=only for units with S_0 interface

Versions

Order No.	Description: Full duplex audio codec
OC7200/E/128	(basic unit) with 1 x S_0
OC7200/E/256	with 2 x S_0
OC7200/E/384	with 3 x S_0
OC7200/E/X.21	without S_0 interface
OC7200/E/NET	with 1 x 10Base-T
OC7200/E/NET128	with 1 x S_0 and 1 x 10Base-T
OC7200/E/NET256	with 2 x S_0 and 1 x 10Base-T

Optional Accessories

Model	Description
OC/IMD4 ISDN Update Kit	ISDN extension for $2^{nd}/3^{rd}$ S_0 connection
OC/NET Net Update Kit	For the upgrade of those units without an Ethernet extension. The NETControl can also be downloaded free of charge from www.orban-europe.com

Guarantee and Maintenance

Unless otherwise stipulated, standard guarantee regulations are valid and applicable. Damages resulting from changes or improper repairs by the orderer or a third party are not covered by the guarantee.
The OPTICODEC has no user-serviceable parts.

OPTICODEC Test Number

Call the ORBAN Europe GmbH ISDN test number +49 7141 22 66 22. Audio is permanently connected.

ORBAN Europe GmbH OPTICODEC V4.25_Engl. 23/10/007R013_NP/DF/Lo

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