

Call Recorder ISDN Manual



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1 Introduction

The Call Recorder ISDN is an audio recorder that has been specially designed to record telephone conversations from ISDN basic connections (S0 buses). There are models for 1, 2 and 4 S0 buses which are technically virtually the same. A Call Recorder ISDN has certain special features: It can record from 1 to 4 ISDN buses and from 1 microphone. It records digitally

- It starts and stops recording automatically (or manually for microphone recordings)
- It archives the recordings to facilitate searching
- It highly compresses recordings, resulting in a large storage capacity
- It can interface with computers and networks using the Ethernet interface and TCP/IP protocol with the built-in FTP server
- It comes with a chip card (IC Card) reader to safeguard security

A Call Recorder is configured to record **simultaneously** from the signal sources present:

- 2 recordings per S0 bus, i.e. 8 recordings at the same time
- 1 recording from a microphone

The total number of recordings it can make simultaneously is therefore 9.

The recordings are stored on an internal hard disk. The storage capacity is expressed in the number of hours of recording time with standard compression. There are 5 different types of Call Recorder:

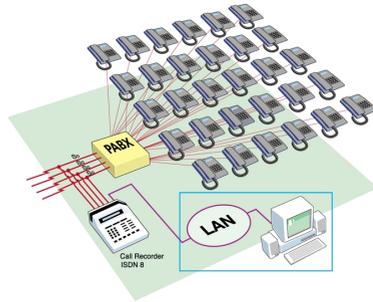
Art. 1490	Call Recorder ISDN 1xS0 2 calls, 2600 hours
Art. 1492	Call Recorder ISDN 1xS0 2 calls, 5200 hours
Art. 1494	Call Recorder ISDN 2xS0 4 calls, 5200 hours
Art. 1496	Call Recorder ISDN 2xS0 4 calls, 7800 hours
Art. 1498	Call Recorder ISDN 4xS0 8 calls, 7800 hours

The capacity can be increased or decreased by setting different compression methods. The capacity is at its lowest when the recorder is set to not use compression and the ISDN signal is stored mixed but is otherwise unchanged. The capacity at this setting can be calculated by dividing the capacity indicated above by a factor of 7.5.

1.1 Connecting to Record Calls

A Call Recorder ISDN can be used in various ways:

1. As a desktop machine that usually records one's own calls. The smallest type, ISDN1, is most commonly used for this purpose. The advantage of this way of using it is that the recordings are always available at one's own desk.
2. As an appliance between the ISDN network-lines and the telephone exchange, and which records all external calls of a firm. In this case one of the bigger versions, ISDN2 or ISDN4, would usually be more appropriate. The advantage of this method of connecting is that the calls of all the phones in a company are recorded and that each individual one can be recognized.



connected between the network lines and the telephone exchange

1.2 Mixing, Compression and Capacity

A Call Recorder ISDN applies two methods to efficiently store the ISDN signal. First the incoming and outgoing signals are mixed digitally, which results in a digital recording of the same quality as the original signal. Every recording is then compressed by a factor of 7.5. The resulting compressed recording is theoretically of a lower quality, but any difference with the original is difficult to hear.

Based on the experience gained with the thousands of Call Recorders already delivered, it can safely be said that the standard compression applied to telephone calls is fully satisfactory.

If the quality of the recordings is especially important, it is possible to set a lower compression factor; the advantage is a significant gain in quality, the

disadvantage a lower storage capacity. When only telephone conversations are being recorded, little is gained because the quality of the telephonenumber itself is a limiting factor. Less compression, resulting in a higher quality, will make a difference, however, when one is recording a meeting via a microphone.

High and low compression can be interchanged. It is sufficient to change the setting prior to recording. The recorder will recognize the compression method used when the recordings are being played

The maximum number of recordings that can be stored in the recorder having a hard disk is 300,000 for all models, which means there are no practical restrictions.

When the hard disk is approaching its full capacity, the recorder will give a warning signal well in time for the user to check if there are any objections to the oldest recordings being overwritten.

1.3 The network Interface and Compatibility

All Call Recorders ISDN (as well as the analog models you might come across) have been provided with an Ethernet interface. The purpose of this interface is to exchange recordings with computers and networks.

1.3.1 Network Protocol

The Call Recorder ISDN uses TCP/IP as network protocol. The recorder can be seen as an FTP server with only a root directory. If necessary, a system manager can alter the configuration of the Call Recorder via the Telnet protocol. It is possible to exchange files both on local area networks and via wide area networks and Internet. The network is used in combination with the optionally available Call Recorder Archive software. This standard interface also makes it possible for a third party to supply applications.

1.3.2 PC Compatibility

Call Recorder recordings can be played via the loudspeakers of a PC. If no compression has been applied almost any PC with a sound card will be able to play the recordings. After compression this is no longer possible and special software is needed to play the files.

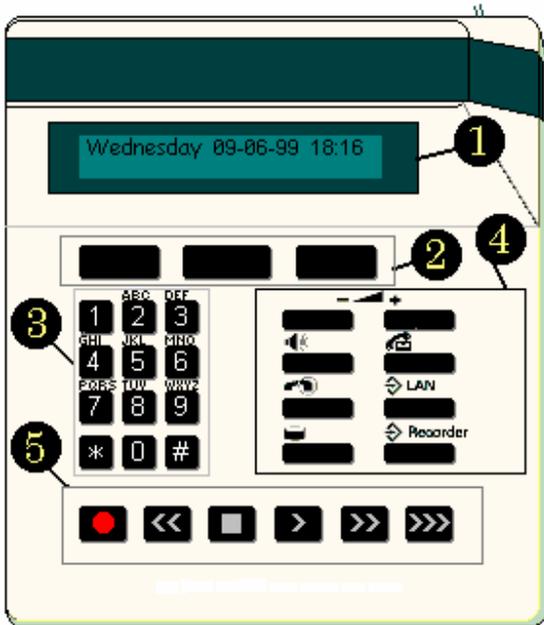
The optionally available Call Recorder Archive Software makes it possible to play direct from standard compression (CRF file format) and is also able to export these recordings without loss of quality to the relatively efficient format ADPCM (.WAV) which can be played on every PC. If compressed files are sent to a third party, they can be listened to with the help of a freeware program provided especially for this purpose by Vidicode. It can be found on our website www.vidicode.nl.

1.4 Security

The user can protect access to the recorder by means of a code. This will prevent others from listening to recordings on the recorder. Access from the network has also been secured by means of codes.

Security with codes is less safe than security with Crypto Cards, available as an option. Crypto Cards also offer a watertight security if the Call Recorder is stolen, or when recordings are sent via the Internet. Without the correct card and the pincode that goes with it it is impossible to listen to the recordings.

1.5 Some Terminology



For clarity the following terms are used to refer to the recorder's controls:

1: LCD or display	The screen that gives the user information
2: Softkeys	The keys under the display that perform the function on the display
3: Telephone keys	The keys 0 and 1 to 9, * and #
4: Function keys	The keys with their function shown above them as a pictogram

5: Recording keys	The keys  ,  ,  ,  ,  and  , similar to those on a cassette or video recorder
--------------------------	---

The following terms are used to describe the recording keys:

	Record key
	Rewind key
	Stop key
	Play key
	Fast forward key
	Special Call Recorder key for selecting the next recording

The following are the function keys:

	Volume control keys
	Loudspeaker key
	Call Recorder key
	Monitor key
	Menu (Configuration) key for network configuration
	Disk key
	Menu (Configuration) key for recorder configuration

2 Installing the Call Recorder

2.1 Unpacking

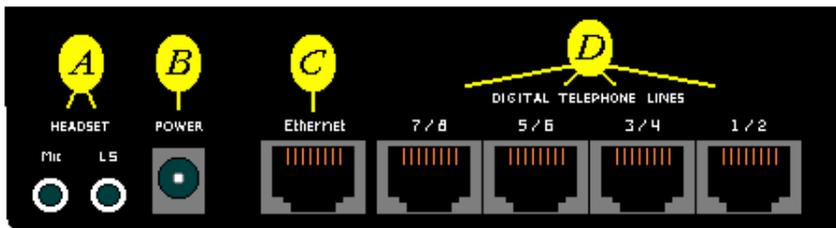
The Call Recorder comes supplied with the following parts:

- mains supply adapter
- 1 ISDN cable of 240cm per S0 bus
- 1 ISDN cable of 60cm per S0 bus
- 1 T-connecting piece for ISDN cables per S0 bus
- this manual

2.2 Connecting the Call Recorder

The way the Call Recorder is connected depends on the intended use. The connections available are listed below.

- A** Connection for headset/microphone/external speakers (not compulsory)
- B** Connection for external mains supply
- E** Connection to a 10BaseT Ethernet hub/switch (not compulsory)
- D** 1 to 4 S0 buses of ISDN basic connections



2.2.1 Connecting the power supply

This is done as follows:

B Connect the external mains supply adapter to B

The recorder has been designed to be permanently connected and there is no on/off switch. It comes with an internal battery which is provided only to serve the power supply to the internal clock.

2.2.2 Connecting the S0 buses

The ISDN S0 bus allows for several machines to be connected in parallel. They are connected as follows:

D Connect the S0 buses to the ports marked Digital Telephone Lines 1-2, 3-4, 5-6, and 7-8.

Disconnect the connection between a wall socket and the ISDN phone or switch. Reconnect again with one of the cables supplied and the T-piece. Connect the recorder with the other cable supplied. It does not matter in which place the recorder is connected or where the short or the long cable is used. The cables can be used in the way most suitable to your situation. Connect to the recorder as follows:

- With a recorder ISDN1, connect to the 1-2 port
- With a recorder ISDN2, connect to the 1-2 and/or the 3-4 ports
- With a recorder ISDN4, all ports can be used

2.2.3 Connecting external loudspeakers (not compulsory)

The LS port can take various components having an audio input. Some common components are:

- Amplified loudspeakers such as those used for PCs
- Headsets, such as those used for PCs
- Another recorder, if a recording needs to be transferred onto tape

If loudspeakers are connected, they tend to be the loudspeakers that PCs come equipped with. Such a set will have a stereo connection, and as the signal coming from the Call Recorder is mono, the sound will come from only one speaker. This can be solved by connecting the loudspeakers in parallel. The optionally available loudspeaker set art. 1197 is already connected this way.

A Connect audio apparatus to the 'LS' port

2.2.4 Connecting the microphone (not compulsory)

The Call Recorder may be used as a dictating system or recorder of meetings. An external microphone can be connected for this purpose. A headset is commonly used both for recording and reproducing. The optional article 1196 available from Vidicode is a conference microphone suitable for small meetings.. Your supplier will be able to advise you about a microphone system suitable for bigger meetings which can be used in combination with the Call Recorder.

A Connect a microphone to the 'Mic' port

2.2.5 Connecting to the LAN (not compulsory)

If you possess PC software for the Call Recorder the following connection is possible:

C Connect the Ethernet port of the recorder with a hub or switch of your network using a standard network patch cable

This is the preferred way for an office environment.

The port to be connected to needs to support 10-BASE-T (10 Megabit), which is almost always the case, as most modern network ports automatically switch between 10 Megabit and 100 Megabit. It is better to connect to a switch above a hub.

For a direct connection between the Ethernet port of the recorder and the Ethernet port of a PC

E Connect the Ethernet port of the recorder with the Ethernet port of the PC using a special crossover cable

In this way a very fast connection between a PC and a recorder can be established for applications where there is only one PC and one recorder. When such a fast connection is required but the PC has no Ethernet card but instead has a USB port, as is common on notebook PC's, a USB to Ethernet adapter can bridge the gap and offer a cost efficient high speed connection.

The cable for this connection is not supplied, as such cables can vary widely in length and configuration. Most system managers will have a supply of them in stock.

2.3 Turning on the power

Connect the mains supply adapter to the mains. The display will show the following text:

```
RESET
```

Followed by:

```
INIT
```

Ending with for instance:

```
Monday    19-08-01 10:53  
Call Recorder
```

Sometimes the following message is displayed:

```
Monday    01-01-00 00:00  
***The clock is Wrong***
```

This means that the clock has not been configured yet, and should first be set to the right date and time. How to do this is explained in the next chapter, which covers configuring the Call Recorder.

3 Configuring the Call Recorder

A newly installed recorder will record all telephone calls of the S0 buses to which it is connected without any further adjustment. With the help of a number of installation questions, however, it is possible to adjust the recorder even closer to the wishes of the user.

The installation menu can be reached by pressing the configuration key  **Recorder**

Access to the recorder may have been secured with a password. At delivery this is not yet the case.

When installing, you will find the options represented by the softkeys indicated on the display. You can scroll through the options with the recorder keys.



selects the previous menu function



selects the next menu function (similar to 'NEXT')

3.1 Loudspeaker

This determines whether the internal loudspeaker is used when playing or listening in to the recordings. If it is not used, an external loudspeaker should be connected.

The display shows:

Speaker:	On	
NEXT	CHANGE	STOP

The internal loudspeaker is switched On or Off with the CHANGE softkey.

3.2 Playback Volume

Volume:	10	
NEXT	CHANGE	STOP

This option sets the preferred playback volume either of the internal loudspeaker or of the loudspeaker connected to the loudspeaker port (LS).

By repeatedly pressing the CHANGE key the volume that is set when playing starts can be adjusted from the value 0 to 15. When playing the recording the volume can be temporarily adjusted even further with the volume keys. The volume settings will be stored but the temporary adjustments will not.

3.3 Speech Compression

The display shows:

Compress Speech:	Yes	
NEXT	CHANGE	STOP

Thanks to speech compression the recorder can store a great number of hours of speech. The compression applied is a factor 7,5 compared to standard ISDN, after the incoming and outgoing signals have first been mixed. Quality loss as a result of compression is minimal, and you are strongly advised not to switch off compression. There is no objection to temporarily switching off compression if you want to assess the difference in quality for yourself. In that case new recordings will not be compressed. After you have switched on compression again, however, **all** recordings not yet compressed will be compressed. Microphone recordings will not be compressed. Compression does not work in combination with the Crypto Card option.

3.4 Use of the CryptoCard

The display shows:

Use CryptoCard:	No	
NEXT	CHANGE	STOP

The use of the Crypto Card option is discussed in Chapter 6. For now it is sufficient to say that the Crypto Card cannot be used in combination with compression. The CHANGE option is therefore not available when compression is switched on.

3.5 The Clock

Clock: Mo 29-03-01 16:48		
NEXT	CHANGE	STOP

To set the clock select 'CHANGE'. The day is set with the telephone keys: Sunday is 1, Monday 2, etc. The telephone keys are also used to edit date and time. The **<<** and **>>** keys are used to place the cursor in the position that is to be changed. Then select 'STORE' to confirm, or 'CANCEL' to undo the editing.

Clock: Mo 29-03-01 16:48	
STORE	CANCEL

3.6 Setting the Password

Password Active:	No	
NEXT	CHANGE	STOP

When CHANGE is selected the same password should be entered twice. Hereafter the password is active. The password is any number you choose with a maximum length of 8 numbers in total.

The password safeguards the access to playing and all settings.

If the wrong password is entered 3 times, the access to the recorder is blocked for 15 minutes, although recording will still be taking place.

Note: Never activate the password if you are uncertain whether you can remember it. The recorder has been very well safeguarded, and if you forget the password you will have a big problem. The password is not active at delivery, and has been set at 0000.

Note: The password does not offer total protection. In theory it could be broken. If extreme safety measures are needed one should use a Crypto Card.

3.7 Selecting the Language

Language:	English
CHANGE	STOP

A selection of languages has been installed. Once you have selected an option here configuration is complete.

3.8 Other Configurations

The Call Recorder has several service menus with more configurations. The use of these should be left to qualified personnel who have studied the service manual. If so desired, access to the service menus can be blocked by an additional service password.

4 Operating the Recorder

This chapter covers the operation of the recorder and additional options for configuring it.

4.1 Recording Telephone Calls

The Call Recorder has been designed to record automatically and cannot be influenced by the user. This can be tested by starting a telephone call. The display will show which line is used, and whether it is an incoming or outgoing connection. You might see, for instance:

```
Friday    07-12-01 15:31
  3<                                8>
```

The display in this example shows that there is an incoming call on line 3, and an outgoing one on line 8. If the connection is a speech connection the call will be recorded automatically.

In the case of a data connection, for example a connection from a PC to the Internet, the display will show that the line is active, but no recording will be made. It will also show that a line is reserved when the handset has been taken off the hook, but as long as there is no connection no recording will take place.

Via service menus it is possible to set the recorder in such a way that failed connections and data connections are also registered, albeit without recording in the case of a data connection. This will only be of interest in special applications, however. In order to keep the content of the recorder clear, the basic configuration has been set not to register failed connections and data connections.

4.2 Recording with the microphone

The Call Recorder can be used as an audio-recorder at any time, with the same high capacity it has when recording telephone calls. Provided a microphone has

been connected, the Call Recorder is ready for recording at any time. It does not matter if telephone calls are being recorded as well.

Experience has shown that the Call Recorder is mainly used as an audio-recorder in meetings, to facilitate note taking.

Automatic Volume Control and the Microphone

An important feature of the Call Recorder is that it will automatically adjust itself to a weak signal level. This is asking a lot of the Call Recorder, because sometimes the microphone has to cope with a voice speaking right into it, whereas when it is recording meetings people may be quite a long distance away. Although the automatic volume control of the Call Recorder is extremely good, it is advisable to purchase a separate table microphone if the recorder is often used for meetings. The quality of recordings via the headset microphone is more than adequate for occasional use. In order to record bigger meetings a special microphone system is required that can be connected to the microphone port.

4.2.1 Recording

Recording is started by simultaneously pressing the Record and Play keys. ( and ). The display will show:

```
Recording Microphone!  
19-08-01 10:59 00:00:53
```

The time counter can be seen to move during recording.

Recording is paused by pressing the Play key. When the Play key is pressed again, recording will continue, while the Stop key stops recording. Next, you can indicate whether you want to STORE the recording or DELETE it, by pressing the appropriate softkeys. The recorder will give you 60 seconds to decide this in; if you do not, the recording will automatically be stored.

```
Code: _____  
STORE      55      DELETE
```

If the Play key is pressed in this situation, the recording can first be listened to, and deleted or stored later.

It is also possible to type in a code that can later facilitate searching for the recording. This code may contain both numeric and alphanumeric symbols . The alphanumeric symbols are indicated above the number keys.

4.3 Searching for and Playing of Telephone Calls

A Call Recorder will first have to search for a recording before playing it.

A remarkable property of the Call Recorder is that it can play a recording while simultaneously recording up to 8 telephone calls. When it is playing you do not have to worry about the recording of telephone calls. When you are recording from a microphone the situation is different. It is **not** possible to record from a microphone and play a recording at the same time.

There are various search criteria, and they can be used in a combined search request, e.g. all calls in March 2002 with telephone number 0123456789.

4.3.1 Searching for (Telephone) Recordings

When  is pressed the following text is displayed:

Playback Calls		
SEARCH	LAST	STOP

To listen to the latest recording press the ' LAST' softkey. The recording will be played straight away.

If the 'SEARCH' softkey is pressed the display will say:

Calls from 31-03-01		
SEARCH	LOCAL	STOP

The Date Search Key

The date can now be changed, either by filling in the exact day, or by typing in a * for day, date and year. The following selection, for example, gives you all the telephone calls from March 2001:

```
Calls from **-03-01
SEARCH    LOCAL    STOP
```

It is possible to press the 'SEARCH' softkey straightaway, or to fill in other search criteria, enabling you to continue to the key 'LOCAL'.

The LOCAL Search Key

Do remember when searching that the other search criteria are enabled as well, so if you want a search of all the calls by a certain local number the date should be filled entirely by wildcards, as shown below:

```
Calls from **-**-**-**
SEARCH    LOCAL    STOP
```

The 'LOCAL' search key refers to the MSN number of the person within your house or organisation who has called, as communicated by your own house exchange or telephone installation to the public network. It is therefore possible to recognize each telephone within a company, so long as it has been programmed in the exchange, which is almost always possible.

The 'LOCAL' search key is therefore used to get a picture of all calls by a specific phone or group of phones within your company.

Note: These data are recorded from the line. In practice one is not always certain whether the area code is represented on the line. We advise you to search for your own number with wildcards in the following way: * (number). The number 179 3617400 would be entered as follows: *3617400.

The REMOTE Search Key

REMOTE refers to the number selected by the caller. This number is only available with outgoing calls.

The 'REMOTE' search key can be used to get a picture of all calls in which a certain number was selected. It might be interesting to do this for all calls in which part of a number, e.g. the country code, was selected. For Germany one would key in 0049*, for instance.

The CONNECT Search Key

'CONNECT' refers to the MSN number of the phone the caller is connected to.

In an outgoing call this need not be the number that was dialled. This sounds strange, but as a rule you dial a main number, whereas the phone that answers may have its own number which you can be connected to directly as well.

In an incoming call 'CONNECT' refers to the number that initiated the call.

The 'CONNECT' search key is used when searching for calls with a specific person or company. In order to search for a specific caller the complete number is entered. This search key can often (but not always) be used to search for calls with a particular company, as MSN numbers tend to differ only in the last digits. You could for instance search on 079 5124*. There is no guarantee, however, that all numbers of a company form such a connecting group.

The LINE Search Key

Each S0 bus has 2 lines available, and depending on the way in which your telephone exchange has been set up, the line number (1 to 8) may offer useful additional information. The line numbers correspond to the numbers on the back-panel of the recorder.

The Search Command

After the relevant search criteria have been entered, the 'SEARCH' softkey is pressed, and the Call Recorder will compose the selection.

Important: It is not necessary to use the search criteria. It is a standard feature of the recorder to enter the date of today, and 'wildcards' for all other search criteria. This does imply that if you are searching for all the recordings of a number dialled, for instance, the date itself should be filled in as a wildcard.

The first recording of the selection made will be displayed, as well as the total number of recordings found.

```

31-03-01 08:53      1/416
SEARCH      INFO      STOP

```

The  and  keys allow you to scroll backwards and forwards in time through the selection made, until you have found the recording you want.

When 'INFO' is pressed, information about the connection will be displayed, e.g. for an outgoing call from 3617400 to 0795423861 the screen will show:

```

3617400 > 795423861
BACK

```

or for an incoming call from 0795423861 to our number 3617400:

```

793617400 < 795423861
BACK

```

4.3.2 Playing the recording

The recording can be played with the  key.

4.3.3 The Function of the Recorder Keys Before and During Playback

The uses of the recorder keys before and during playing back recordings are:

	Before playback	Starts playing the selected recording
	During playback	Pauses playback
	During pause	Resumes playback
	Before playback	Selects the next recording in the selection of recordings

	During playback	Fast forwarding. This is done with increasing speed so that the right place is rapidly found even in long recordings
	Before playback	Starts playing the recordings one after the other
	During playback	Starts playing the next recording in the selection
	Before playback	Selects the previous recording in the selection
	During playback	Fast rewinding. This is done with increasing speed, so that the right place is rapidly found even in long recordings
	During playback	Stops playback

The uses of the telephone keys whilst playing back the recordings are:

1 10 seconds back	2 next message	3 10 seconds forward
4 60 seconds back	5 pause	6 60 seconds forward
7 300 seconds back	8	9 300 seconds forward

* 30 minutes back	0 stop	# 30 minutes forward
--------------------------------	------------------	-----------------------------------

4.4 Searching for and playing microphone recordings

As with playing call recordings, playing microphone recordings always starts with searching for the recording.

Microphone recordings can also be played while telephone recordings are being made.

There are only two search criteria for microphone recordings, date and code.

4.4.1 Searching for microphone recordings

Press the  key to indicate you want to play microphone recordings. The display might show:

```

Playback Mic.records
SEARCH   LAST   STOP

```

Searching is different from searching for call recordings because there are fewer search criteria.

To listen to the latest recording press the 'LAST' softkey. The most recent microphone recording will be played.

If the 'SEARCH' softkey is pressed, the display will show:

```

Mic.recs from 31-03-01
SEARCH   CODE   STOP

```

The DATE Search Key

The date can now be changed, either by filling in the exact day, or by typing in a * for day, date and year. The following selection will give you all the microphone recordings from March 2001.

Mic.recs from **-03-01
SEARCH CODE STOP

Now either press the 'SEARCH' softkey straightaway, or fill in further search criteria, with the possibility of continuing to the CODE key.

The CODE Search Key

The CODE search key is unique to microphone recordings. Earlier on, in 4.2 you have seen that it is possible to type in a code, when stopping a recording.

The first recording of the selection made will be displayed, as will the total number of recordings found.

20-06-01 11:26 1/25
SEARCH CODE STOP

The  and  keys allow you to scroll backwards and forwards in time through the selection made, until you have found the recording you want.

The recordings can be played with the  key.

The user can change the CODE search key at a later moment. In this respect 'CODE' differs from the other search criteria.

4.4.2 Playing the microphone recordings

See the instructions in 4.3.2 about playing call recordings, as the procedure is exactly the same.

4.5 The DISK key

The Call Recorder is meant for continuous automatic recording. The hard disk will be written to until it is full, at which point the oldest recordings will be automatically overwritten. If compression has been switched on, this will perhaps only be after several years of continuous usage. Of course this depends on the number of calls and the capacity of the hard disk.

The disk function key  can be used to retrieve information about the contents of the hard disk in the recorder.

```
Free: 1032 (7772) Hours
NEXT                               STOP
```

Two numbers are displayed, i.e. the space without compression and the space with compression.

The next display is of special importance if the disk is ever full up.

```
Oldest record.: 01-11-00
NEXT                               STOP
```

As has been said before, when the disk is full, the oldest recordings are automatically erased. This information enables you to determine whether that is a problem.

The third function informs the user of the total number of recordings on the hard disk. This is the total of recordings from both sources: telephone lines and microphone.

```
Total recordings: 14325
                               STOP
```

4.6 The Monitor

The monitor makes it possible to listen in to conversations via the recorder. While the recorder is in use, the display will indicate which lines are engaged, e.g.:

```
Monday 10-12-01 14:01
1> 2<      5<      7<
```

If you wanted to listen in to the incoming call on line 2, you would press the Monitor key ()

The display will show:

```
Line Monitor
(press 1-8)      STOP
```

Now press the number 2. From then on you can listen in to the call on line 2. You stop the listening in by pressing the 'STOP' key ()

Once activated, the monitor function stays active with every other call on the same line. Therefore the monitor always needs to be switched off manually.

5 The Network Interface

Every Call Recorder has been provided with a 10BaseT Ethernet interface. This type of interface is the most common one for local area networks and connection to the Internet.

The protocol chosen for communication via the Network is TCP/IP, the Internet protocol that can be used on most local area networks.

5.1 The possibilities

The main reason for developing the network interface is to offer the possibility to centrally archive the recordings, or to make a back-up copy of the recordings. The optionally available Call Recorder Archive Software can be used for archiving a maximum of 4 recorders.

The biggest advantage of the network interface is the high transfer speed of big audio files, another is that they can be retrieved both via the internal network and via the Internet. There are other possibilities, however, and these are listed below:

- Archiving by own applications with the help of FTP. The recorder works as a normal FTP server.
- Audio monitor function; recordings can be listened to remotely via the loudspeakers of a PC
- Remote configuration by system managers

There are various ways in which the connection can be made, so that it is almost always possible to archive or listen remotely. The various possibilities are discussed below, from very simple to very elaborate.

- Connecting one PC with one recorder is possible by supplying the PC with a networkcard and connecting the PC via a special (crossed) cable. An even simpler way is to use a USB to Ethernet adapter, available as a cable. They produce a very fast connection between the PC and the recorder.
- Connecting a PC with various recorders in the same building is possible by connecting all recorders and the PC onto the local network.

- A good example of a simple solution to get access to a number of recorders at a distant location is to work with an ISDN router with hub, as provided by several manufacturers such as Cisco or Intel. The recorders are connected to a hub, and a PC with our archive software is connected to the hub via its ISDN software.
- In a large scale application, PC's and recorders are connected via the internet or an intranet.

5.2 Configuration

Configuring the network function of a Call Recorder for local use is not especially difficult, although within a company environment it is advisable for the network manager to enable the network function of the recorder. He or she is the person best suited to judge how the recorder should be configured to function properly with the other systems on the network.

The remote use of the recorder via the Internet or an intranet is less simple. The system manager should allow for the interaction between the recorders and the router/gateway/firewall combination that connect the local network and the wide area network.

Press the  LAN key to configure the network. Please keep in mind that it is not possible to configure the network whilst recording. The key will not react in that case. For network configuration the following settings are available:

Network active:	Yes
NEXT	CHANGE BACK

If you do not use the network, the answer here should be "No". The next question concerns FTP, which can be used for archiving, for example.

FTP active:	Yes
NEXT	CHANGE BACK

When FTP is not used the answer to this question should again be "No". If it is used, there are two follow-up questions:

FTP ID: 0000		
NEXT	CHANGE	BACK

This is the ID a user should give to approach a Call Recorder via FTP. There is only one possible ID.

FTP code: XXXXXXXX		
NEXT	CHANGE	BACK

This is the password for a FTP session. The default is 0000.

FTP Server Port: 21		
NEXT	CHANGE	BACK

Access via the Internet on a network with several FTP servers, e.g. several Call Recorders, can pose problems for the router if the IP port for all FTP servers is the same. If that is the case, it may be necessary to set a number as an alternative to the common value of 21. In all other applications the default value of 21 should be maintained. If a different value is set the system manager should take care that there is no conflict.

The next question concerns a property of your network:

Use DHCP Server		Yes
NEXT	CHANGE	BACK

If there is a DHCP, server, the recorder will automatically be assigned an IP address (network address), in which case any application called up by the recorder will ask for the IP name of the recorder. If DHCP is not available the user will have to give an IP address himself, which will be used by any application approaching the recorder:

```
IP addr: 168.102.000.012
NEXT      CHANGE      BACK
```

If DHCP is available, there is no opportunity to change the IP address manually:

```
IP adrs: 168.102.000.012
NEXT      BACK
```

In an application with linked networks without DHCP server there will not only be a question about the IP address, but also about the IP subnet mask:

```
IP mask: 255.255.255.0
NEXT      CHANGE      BACK
```

The IP subnet mask is only applicable for access to recorders via the Internet or intranet. Normally you will not have to change this setting.

If there is an IP subnet mask, there will be a gateway to the other network as well, and the address of this gateway will be filled in. This should also be done if there is a DHCP server.

```
Gateway: 0.0.0.0
NEXT      CHANGE      BACK
```

If the gateway is not applicable in your situation, you do not change anything.

If DHCP is used, the address mentioned here has come from the DHCP server and the name found in the next question will be used :

```
IP name: CRPeter
NEXT      CHANGE      BACK
```

With most networks with a DHCP server it is possible to call the IP name of the recorder, rather than the IP address. In that case it might be worthwhile to change

the IP name into an easily remembered name such as CR-Peter. You should always do so if it is possible to call the recorder with the IP name. Only if it is not possible to call the recorder with its IP name, even though a DHCP server is being used, should the IP address used to approach the computer be read from the display of the recorder.

The next question concerns the use of the monitor function (Listening in via the network).

```
Monitor active:      Yes
NEXT      CHANGE    BACK
```

If the monitor is active, it allows you to set the accesscode for the monitor function.

```
Monitor code: XXXXXXXX
NEXT      CHANGE    BACK
```

5.3 Use of the network interface

5.3.1 The FTP protocol

FTP is the standard method to ask for files via the Internet, which explains why there is a lot of software that can retrieve the files of your Call Recorder. This possibility is mainly of interest to developers, however.

Our **Call Recorder Archive Software** will be of more interest to the Call Recorder user. In order to be able to use the archive software, the network functions and FTP should be enabled. Depending on whether there is a DHCP server present in the network, the IP address or the IP name should be given as well. When both the PC with the software and the Call Recorders are connected to the net, all recordings can be archived at a very high speed via the LAN.

The use of Call Recorder Archive Software and the installation of it on the PC are explained in the helpfile that comes with the software.

5.3.2 The monitor

The monitor protocol of the Call Recorder is not standard. For this reason the monitor is of special importance for users of the **Call Recorder Monitor Software** option.

To use Call Recorder Monitor Software the network needs to have been enabled and the IP address or IP name given. The monitor function should also be operating. The PC with the software will then be able to select from the recorders present and to listen in to the conversations via the loudspeakers or headset.

The use of Call Recorder Monitor Software and its installation are also explained in the helpfile that comes with this software.

6 The Crypto Card option

The Crypto Card is, along with the Archive Software, the most important option of the Call Recorder. Every Call Recorder has been provided with an IC card reader. If a set of Crypto Cards is purchased, the recorder will automatically be able to work with them.

Crypto Cards restrict the use of the Call Recorder ISDN, because compression of the coded files will not be possible.

6.1 How a Crypto Card works

The Crypto Card works as follows:

- All recordings that are made while the Crypto Card is inside the computer are coded. These recordings can only be played if one possesses a card from the original set.
- Recordings are uniquely recognizable by the card number.
- The card has been safeguarded against interfering with a pincode or, if this has been lost, with the PUC (Personal Unlock Code) provided at delivery.

As we have already seen, it is possible to configure the recorder in such a way that recording can only take place with the card.

The function of the card is as follows:

- To ensure users who keep their cards with them that their recordings cannot be listened to without their approval.
- To make it safe to transport recordings via the network or the Internet, because they cannot be listened to without a card from the original set.
- To protect against unauthorized listening in, if the monitor function is used, so that it is safe to listen to a conversation via Internet.

This method of protection is similar to the protection of telebanking via Internet, and the risk that this form of protection is broken is very low.

6.2 Changing the Card Code

The card code (PIN code of the Crypto Card) is only used when playing recordings made with the Crypto Card. Select the option "Changing the Card Code" from the settings menu. The recorder will first ask for your present card code:

```
Card code: XXXX
CONTINUE          STOP
```

The new card code can now be entered:

```
New card code: XXXX
CONTINUE          STOP
```

The code then has to be entered once more as a check:

```
Repeat code: XXXX
CONTINUE          STOP
```

The display will then show:

```
New card code accepted
                      STOP
```

If the wrong code has been entered three times running, the recorder will automatically ask for the PUC. That will start a similar procedure with which a new card code can be entered.

The PUC code must be entered correctly. Entering an incorrect PUC code five times running will lead to the card being made invalid.

WARNING

If you lose the PUC **and** the card code it will not be possible to play the recordings made with the card. Your manufacturer **CANNOT** help you with this, and the recordings will be permanently lost. For this reason we strongly advise you to keep the PUC and a copy of the card in a secure place, such as a safe.

6.3 Recording with the Crypto Card

The Crypto Card can only be used if it has been configured to do so at installation (See 3.4). If use of the Crypto Card has been set at installation, no recordings will be made unless the card had been inserted.

Simply insert the Crypto Card in the recorder to operate it. The display will show straight away that the card has been inserted and a sound signal will be heard. All recordings will now be coded.

6.4 Playing Recordings with the Crypto Card

In order to play a recording the usual procedure for selecting a recording applies.

When you want to play coded recordings, the recorder will ask for your card code:

Cardcode: XXXX
CONTINUE STOP

Enter the code and confirm with 'CONTINUE'.

The code does not need to be entered continually; it will remain valid for the entire session. The code only becomes invalid when the recorder has been left untouched for 15 minutes, or when the card is removed.

Playing coded recordings **CANNOT** be done at the same time as recording from the line. Before starting to play, the recorder will ask permission to stop recording:

Stop Recording?	
YES	NO

Obviously it will not be possible to play coded recordings with a card from a different set. The original Crypto Card will be needed not only when playing, but also when erasing a recording or changing the code of a recording.

7 Erasing Recordings

A Call Recorder has been set up in such a way that it is not necessary to erase recordings. When the Call Recorder is about to run out of space, it will start erasing recordings automatically. These will always be the oldest recording. Automatic erasing only occurs after the total capacity of the hard disk has been used up.

You may want to erase a recording yourself, because it contains confidential information that you do not want to fall in the wrong hands. Or, on the other hand, you may consider the possibility of erasing highly undesirable in your application.

In contrast to the analog desktop recorder for 1 line, the Call Recorder ISDN does not have the option of erasing recordings in its basic configuration. In order to enable erasing, a system parameter needs to be changed, which can be done by either your supplier or the system manager. The person in question will have to consult the Technical Reference Manual, and he may need to have access to the system password of the Call Recorder. Once the option to erase has been enabled, every recording can be erased thereafter.

One important difference between erasing a recording on the Call Recorder and erasing a file on your PC, however, is that the Call Recorder will genuinely erase the recording, so that it cannot be retrieved, whereas a recording erased by the PC is very easily found, and will only disappear if the space it takes up happens to be needed for something else. The disadvantage of erasing in the way the Call Recorder does is that it takes time to make space on the disk; the advantage is that you can be sure that the information has disappeared.

To erase a recording proceed as follows:

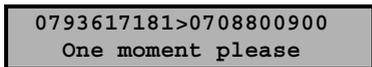
Look up the call the way you are used to. You now see, for example:

20-11-01 15:37	1/5	
SEARCH	INFO	STOP

Press the 'INFO' softkey. The display will show:

0793617181>0708800900		
ERASE	BACK	ERASE

Press both 'ERASE' softkeys simultaneously. The display will now read, for example:



0793617181>0708800900
One moment please

As has been mentioned before, this takes some time because the recording is being erased.

8 Maintenance

Experience with products similar to the Call Recorder has taught us that you can expect it to have a long life. The electronic parts of the Call Recorder do not require any maintenance, but the mechanical parts may suffer wear and tear.

8.1 Changing the Disk Drive

Please bear in mind that the life of a disk drive (hard disk or LS 120 disk) is shorter than that of the recorder itself. For this reason we advise you to replace the hard disk **preventatively after four years of use**. If, after an external accident, such as dropping the recorder, the recorder does not seem to function optimally any more, it is also better to replace the disk.

The life of a hard disk can be longer. If regular backups are made with the help of the Call Recorder Archive Software it may be possible to change the hard disk after 5 years.

When replacing a hard disk, the manufacturer can copy the old recordings onto the new disk.

8.2 Changing the Battery

It is very important that the internal clock of the Call Recorder stays working, because date and time are the most important search criteria. In the case of a power cut the clock will keep running on the internal battery. This is a standard CR2032 cell available at almost every electronic or photo shop. We advise you to change this battery every 3 years.

This is done in the following way:

- Unplug the recorder
- Open the recorder by unscrewing six screws at the bottom.
- Put the keyboard diagonally next to the recorder so that the connecting cable need not be disconnected.

- Replace the battery
- Screw the recorder shut again
- Set the clock as described in chapter 3.5.

9 Accessories

There are several accessories available for your Call Recorder:

Call Recorder Archive software for Microsoft Windows (versions 95/98/ME/XP/2000/NT4), order number 1352

The function of this software is to archive the recordings of your Call Recorders on a PC. These recordings can be played directly from the archive via the loudspeakers of the PC.

This software can be used with all model Call Recorders that possess a network interface. It is therefore possible to build up a combined archive of recordings made with Call Recorders ISDN and Call Recorders for analog lines.

The software approaches Call Recorders as FTP servers. This method of connecting can be used in almost every type of network connection. For more information see Chapter 5.

The most important functions of the software are:

- Retrieving the contents of 1 to 4 recorders and displaying them in a database
- Searching for recordings in an often very extensive database with the help of queries (search commands)
- Transferring all recordings or a selection of them to the hard disk of the PC
- Playing via the loudspeakers of a PC
- Exporting to standard PC format for sending to a third party via e-mail or another medium
- Making sub-archives for storage on CD or DVD with the help of a CD recorder or DVD recorder

The Archive Software can also be used to automatically retrieve all recordings, so that there is always a back up of them present in the recorders. The Archive Software is an almost indispensable accessory of the Call Recorder ISDN.

Crypto Card option, order numbers 1350, 1356 and 1357

This option has been extensively described in chapter 6.

Crypto Cards can be supplied in three different ways:

- Article 1350, set of 3 identical cards
- Article 1356, set of 6 identical cards
- Article 1357, set of 4 x 3 different normal cards and 3 master cards that can be used to play the recordings of the other cards.

Article 1357 is meant to be used as security in combination with Call Recorder Archive Software that can archive the recordings of four recorders in a PC via LAN, Internet or intranet.

Monitor Software, order number 1354

Monitor Software makes it possible to listen in to the recordings of a Call Recorder via a LAN or via Internet. The user can choose from a list of recorders.

Crypto Card reader for the PC, order number 1351

The Crypto Card reader is needed for playing recordings made with a Crypto Card on a PC. It can be used both with Call Recorder Archive Software and with Monitor Software.

Table top Microphone for Recording Meetings, order number 1196

When the Call Recorder is regularly used for recording meetings, some users prefer a tabletop microphone to use of the headset microphone. Various common models can be used. The microphone referred to here is one especially designed for video conferencing, eminently suitable for recording group conferences.

Multimedia Loudspeakers, order number 1197

When the internal loudspeakers do not suffice, multi media loudspeakers with built-in amplifiers can be connected to the LS-connector of the recorder.

10 Guarantee Conditions

This chapter gives a general overview of the guarantee conditions. We can send you a copy of the complete text on request.

Your Call Recorder has a 12-month factory guarantee. The guarantee is effective for normal use only. We would like to emphasize that the guarantee is not valid under exceptional environmental conditions, such as extreme temperatures or humidity levels, nor in the unlikely event of a lightning strike. The guarantee is also not valid if the machine has not been handled properly, for example when it has been dropped, or bumped into. Hard disks are fragile.

In order to qualify for guarantee, you should contact your supplier, and show the receipt. If your supplier cannot help you, you should contact the manufacturer. The manufacturer reserves the right to determine the final date of the guarantee period on the basis of the date of production. Costs of transport to and from the supplier or the manufacturer are for the buyer's account.

We would like to stress that the guarantee is for parts only, and does not cover any costs resulting from the breakdown of the Call Recorder or its software.

11 Additional Information

Call Recorder ISDN have various extra features that have not been described in this manual. Additional information about this is given in a technical information bulletin meant for suppliers; users can order this, or download it from the Vidicode Internet websites (WWW.VIDICODE.NL or WWW.VIDICODE.COM for USA)

Subjects discussed in this technical documentation are the very extensive further configuration options, remote configuring, and how to put a new software version in the recorder.

The further configuration options concern all aspects of operation, but in our experience most people are interested in configurations related to user's access and special ways of recording.

The way in which the Call Recorder ISDN operates, can be modified by your supplier and other experienced programmers to fit in with your specific wishes. That is why it comes supplied with its own programming environment, Argus BASIC. At the moment the manual of Argus BASIC for the latest version of the Call Recorder (with IP connection and IC card) is not yet available, but it will be published via the Internet in the near future.

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