SCOOPY

Mono/Stereo Portable CODEC

ISDN / POTS / GSM / USB

User Manual

AETA AUDIO SYSTEMS

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AETA AUDIO SYSTEMS

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1. SCOOPY – Easy quick Start

1. Connect the modem cable from the ANALOG socket to the wall phone socket Always use this cable (a modem cable is wired differently from a telephone cable) or connect a RJ45 cable from the ISDN socket to the ISDN wall point. For GSM mode you have just to connect an antenna.
2. Connect the power cord and clip the cable under the small plastic clip
3. Plug in audio connections (microphone and headphones).
4. Hold the ON  button on the front panel (circle with vertical bar) for 2 seconds
5. As the machine is booting you will see the words “Analog” “Mobile” “ISDN” displayed. A star appears after the mode that the machine is in. If you press the button below the mode you want at this point, you will select that mode. You can also change modes my selecting “Setup” then “Net” after the machine has finished booting.
6. The small knobs are for the mic gain the large ones are the headphone gain. There is a knob on the outside of the Headphone gain knobs. This is the headphone mix of yourself and incoming studio.
7.

   - To use direct dial “Number” mode, enter a number
   - To dial one of 5 last numbers press  “green phone” key once.
   - To use a profile number, enter a letter

   For 2 last modes, select the profile number via keypad (left and right key)
8. Press  “green phone” key again for dialing.
9. If busy or bad connection Press  "red phone" then press the  “green phone” key twice to redial the last number dialed.
10. Connection status will be displayed in LCD screen once connected.

2. Introduction

2.1. Functions

The Scoopy is designed to enable radio broadcasters to conduct high quality live two-way remote broadcasts, or two way commentaries with return cue, via ISDN, POTS lines or GSM.[1]

2.1.1. Algorithms

The Scoopy contains a stereo* / mono audio compressor/de-compressor (Codec) that performs all necessary ISDN and POTS algorithms.

In ISDN mode, the user can select one of four operational audio standards:

1. **Phone mode** (G.711, 3,5kHz)
2. **Live speech** (G.722, 7kHz, low delay)
3. **Music CD quality** (Layer II, 20kHz)[2]
4. **Live concert** (4SB-ADPCM,15kHz, proprietary low delay) [2]

In POTS mode, the user has only live speech mode (CELP , 7kHz)
In GSM mode, the user has only GSM codec mode (300Hz – 3.5KHz)

One outstanding feature of Scoopy codec is the 5A System® on receiving an incoming ISDN call, the unit can automatically detect the coding algorithm and parameters of the calling codec, and then adjust itself in a compatible configuration so that the connection succeeds regardless of the initial configuration and that of the remote unit.

2.1.2. Inputs

The Scoopy contains a two channel audio mixer that enables two microphones to be mixed plus one line input (extra line for external event information or guide line). Each of the inputs can be used as input line-level for use with an audio recorder system or an external mixer. These two inputs can be used as a stereo input in ISDN mode*.

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[1] Depending on configuration version

[2] On the 15kHz ISDN version

® 5AS = Aeta Audio Advanced Automatic Adjustment System

* option

2.1.3. Outputs

Two headphone sets can simultaneously be connected to the unit. Each headphone has its own volume and local/cue adjustment to mix the received and sent signals.
A separate XLR line output allows connecting the return audio to a Pre-Amplifier or to other audio system. The headphone output 2 can sent on this line output by menu.

2.1.4. Transmission

Using an ISDN line, transmission bit-rate is either 64kbps or 128kbps[2]. Using a POTS line, transmission bit rate depends on the telecommunication network quality. The Scoopy transmits data with a minimum rate of 12.000 bits and a maximum of 24.000 bits of information per second

The Scoopy can work in many countries using various ISDN standards.

As ISDN protocol may vary from country to country, consult your AETA dealer before carrying your Scoopy abroad.

2.2. Applications

News remotes.
Live sport commentaries with local contributors.
Remote two-way interviews.
Remote contributions into studio discussions.
Live music concerts.

3. Setting up the SCOOPY

3.1. Power

The unit can be powered by 6 type "C" or LR14 Alkaline cells. Heavy-duty Alkaline cells or rechargeable NiCd or NiMH cells can be used.

Caution: **OBSERVE THE CORRECT POLARITY WHEN INSERTING THE BATTERIES**.

A new set of batteries will last approximately 1 hour 30 in POTS mode. In ISDN mode, the autonomy depends on the algorithm chosen. The green light, near the battery symbol on the front panel, goes off and a red light appears when there is approximately 15 minutes of battery life remaining.

Given that it is not usually possible to know how far a given set of batteries has been discharged before use, it is strongly recommended that you always use a new set of batteries before a new broadcast, and remove and discard those batteries from the unit, after a broadcast.

Instead of Alkaline cells, rechargeable NiCd or NiMH cells can be used. They will last for approx. 4 hours in analog mode, in ISDN mode the operational time is between 3 and 4 hours, depending on the algorithm chosen. Please note that when the red battery LED goes on with rechargeable cells, the remaining operation time is only few minutes.
Although the battery life is far longer when using rechargeable batteries, ensure that they are completely charged before starting a broadcast.
The rechargeable cells must be charged with an external battery charger.

3.1.1. External DC supply

The Scoopy will also work on any external 8 to 15-volts DC source. A typical source will be a car cigarette adapter. Connect your DC power cord to the connector on rear panel of the unit (labeled DC In 8-15 V 2A), and connect the other end into your DC power source.
Connector: Jack 3.5, Center: +, Circle: Ground

Warning: **Polarities must be strictly observed to prevent damage to the unit!**

3.2. Connection to the ISDN

Connect the RJ45 connector of the ISDN cable into the socket marked "ISDN" on the rear panel and plug the other end of the cable into the ISDN wall socket.

The ISDN modem of the Scoopy is a S/T or a U interface depending on the unit type.
You can select the correct ISDN protocol for a given country from the menu.

Given the various kinds of ISDN protocols used in different countries or inside PBXs, ISDN compatibility problems may occur. Please be sure to select the right protocol for the country you are in. In case of difficulty please contact your AETA dealer for advice.

3.3. Connection to the POTS

Connect the RJ11 connector of the telephone cable into the socket on the rear panel marked "ANALOG", and connect the other end of the cable into the telephone wall socket.

The Scoopy's RJ11 socket will accept a 4 or 6 conductor modular plug, but only the 2 center conductors, (typically Red & Green) are used.

Caution: Every country has its own style of telephone connector. Consult your engineers, your local AETA dealer for further advice.

Dialing methods
Telephones dial numbers either by pulsing the line, (you will hear a "clicking" sound similar to that heard when dialing from a rotary dial telephone) or by sending audio tones (DTMF) The Scoopy can dial using either pulse or DTMF tones.

Caution:

Do not connect the Scoopy to a telephone jack that provides power for lighting a telephone's dial.
Do not connect the Scoopy to a party line or coin-operated telephone line.
Not suitable as an extension to a pay phone or use with a shared service line or 1+1 carrier system line.
You should disable call waiting if in use.

PBX and PABX applications

The internal modem of the Scoopy is only approved for use as an extension instrument to compatible PBXs.
Contact AETA AUDIO S.A. or your local dealer for an up-to-date list of PBXs with which the internal modem is compatible.
AETA AUDIO S.A can not guarantee that the Scoopy will operate correctly under all possible conditions of connections to compatible PBXs. Any cases of difficulty should be referred in the first instance to AETA AUDIO S.A.

3.4. Connection to the GSM

3.4.1. How to install SIM card

Steps:
- Switch to off Scoopy
- Remove the external mains power cable and batteries

On the rear panel you have the SIM card holder access. For removing the holder you should press the button near the holder (sim reader) with a pen. Put the SIM card into its holder; slide the holder into the GSM module. You need to connect the GSM antenna on the FME connector on the rear panel before switch on your scoopy.

3.4.2. GSM module

The GSM module is a third band module. It works on 900MHz, 1800 MHz and 1900MHz networks. The latest band is is only in North America.

4. SCOOPY structure

4.1. Front view

The user interface consists of a keypad and LCD display.

Figure 1 - Front panel

1 - Headphone 1 : Local/Cue and volume adjustment

2 – Input 1 potentiometer

3 – Input 2 potentiometer

4 - Headphone 2 : Local/Cue and volume adjustment

5 – Audio level LED-Bar & Status LED's

6 - LCD display

7 – Keypad

8 – Switch ON/OFF

9 - "red phone" : hang up

10 - "green phone" : call key

11 – Input 1enable indicator

12 – Input 2 enable indicator

13 – Function keys

4.2. Rear view

1 – V24 serial remote control

2 – POTS RJ11 Jack

3 – ISDN RJ45 Jack

4 – External DC Jack

Figure 2 – Rear panel

4.3. Scoopy status

There are 23 LED's on the front panel providing the following information:

- Info (2 yellow LED's): Information (Future use).
- Alarm (red) : When "on", indicates a network problem or no audio synchronization
- Dec (green): When "on" indicates that a successful connection exists and the Scoopy is decoding the POTS or ISDN signal.
- DC (green): When "on", Scoopy use an external DC source.
- Battery (green / red): When green "on" indicates that the battery level is higher than 20%. When the battery LED changes to red, the remaining autonomy of the Scoopy is 15 minutes.
- 1 (red) : When "on", input 1 is enable (open)

- 2 (red) : When “on”, input 2 is enable (open)
- Lim/comp (green/red): When green “on”, the limiter or the compressor is on stand by. When red “on”, the limiter or the compressor is functioning.
- Level meter: 11 LED’s (scale –20 to + 5 VU).
- OVLD (red): Mixed audio overload.

4.4. General synoptic diagram

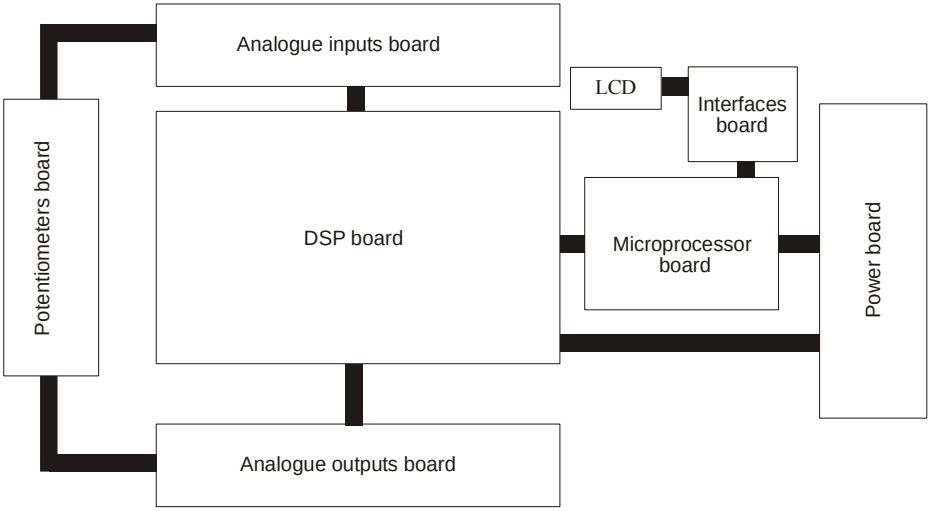


Figure 3 – Scoopy synoptic

5. Audio section

5.1. Encoding and decoding

Scoopy includes a wide range of coding algorithms. First, one can select among algorithms compliant with ISO and ITU-T[1] recommendations:

- G711;
- ITU-T G722 (mono at 64 kbit/s);
- MPEG Audio Layer II at 48, 32, 24 or 16 kHz, with programmable channel mode and bit rate ;

MPEG Audio and G722 algorithms comply with ITU-T J52 recommendation for ISDN transmission.

Besides, other algorithms are available, that are so-called "proprietary" because they do not comply with enforced standards:

- Proprietary MPEG Layer II at 64 kbit/s or 128 kbit/s (for compatibility with ISDN codecs that are not compliant with the J52 recommendation) ;
- 4SB ADPCM, running in mono at a 128 kbit/s bit rate; the bandwidth with this algorithm is 15 kHz ;
- TDAC mono, running at 64 kbit/s, with a 15 kHz bandwidth; available as an option.

The following describes some important features of the various available algorithms and protocols.

5.1.1. Notes about G711

G711 is the standard coding used for voice transmission on public telephone networks. This algorithm is used for links (via ISDN) with telephones or hybrid devices.

[1] former CCITT

5.1.2. Notes about G722

With G722 coding, tree synchronization modes are available:

- "Statistical recovery" byte synchronization method (alias SRT) ;
- H221 synchronization; in this case, 1.6 kbit/s from the compressed data are used for this.
- H221 synchronization and H242 protocol.

H221 synchronization is highly recommended when possible, as it features higher reliability and faster recovery time, while degradation (because of the bit rate used for framing) is minimal.

H242 protocol is recommended by the ITU-T, and is included in J52. However, the mode with H221 synchronization but without H242 protocol can be useful for compatibility with old generation codecs witch did not use this protocol.

5.1.3. Notes about J52 and MPEG coding

The ITU-T J52 recommendation was defined in order to allow the interoperability of various equipments over the ISDN[1], using common coding standards. It includes the following features:

- Interoperation procedures as per ITU-T H242 recommendation ;
- In the case of MPEG encoding, optional protection against transmission errors (Reed-Solomon error correction codes).

It must be noted that, thanks to the interoperation protocol, J52 codecs, when setting up a link, can negotiate automatically and agree on a configuration that is compatible with the capability of both units (regarding bit rate, channel mode, etc.). In this way, when the units differ in their capability (or make), the resulting configuration may be different from expected beforehand, but in most cases the link will work and audio will be transmitted. As another useful consequence, this also gives users more tolerance to mistakes when configuring the units on the two sides of the transmission links, as the codecs will adapt automatically even with differences in the initial settings of the two units.

[1] J52 is not needed nor applicable to leased line connections

5.1.4. Notes about TDAC

As an option, the codec can also include the TDAC algorithm. TDAC is for Time Domain Aliasing Cancellation; this is a transform coding based on an MDCT (Modified Discrete Cosine Transform), encoding a 15 kHz bandwidth mono signal at a 64 kbit/s bit rate. When the option is installed, three modes are available:

- TDAC mono full-duplex, running at 64 kbit/s, with a 15 kHz bandwidth ;
- G722/TDAC : G722 encoding, TDAC decoding, running both in mono at 64 kbit/s ;
- TDAC/G722: TDAC encoding, G722 decoding (with SRT), running both in mono at 64 kbit/s; this mode is symmetric to the previous one.

5.1.5. Symmetric or asymmetric codec modes

The codec allows two communication modes:

Symmetric communication: in this mode, the encoder and decoder both use the same coding algorithm with the same configuration (channel mode, etc.). In this case, the communication is strictly symmetric full-duplex, with exactly the same coding configuration used in both directions (local to remote and remote to local). This is usually required when using proprietary algorithms.

Asymmetric communication: this mode is used for applications requiring different coding configurations in the two directions. The J52 protocol allows such mode. To give some examples, it is possible to transmit MPEG in one direction and G722 in the other one.

With the TDAC option, asymmetric modes are also available wherein one direction is G722 coded while the other one is TDAC coded. Such mode is useful e.g. in order to get a low delay return path encoded in G722 while the send path is encoded with higher quality but a higher delay.

5.2. Audio Interfaces

5.2.1. Mixer Inputs

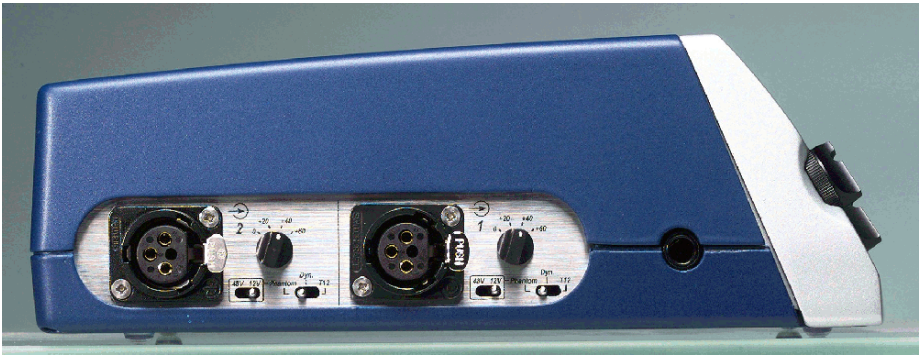


Figure 4 – Left panel "inputs"

The mixer features two symmetrical microphone/line inputs with microphone powering, and an output with limiter / compressor and the line input.

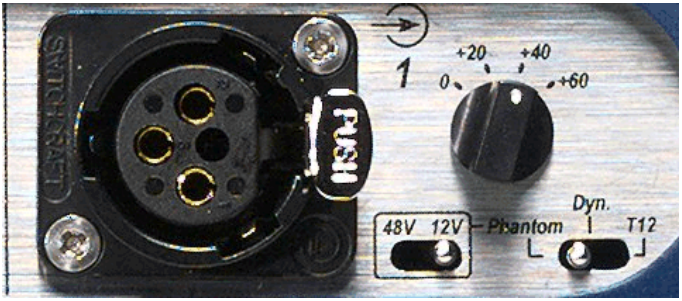


Figure 5 – mic/line input interface

The following elements are available for each mic/line input :

- Input connector: female XLR;
- Pad switch (for the microphone input, the input gain is adjustable by 4 steps of 20 dB)
- Microphone power selection switches
  Dyn.: dynamic microphone or line level

Phantom: phantom power supply (48V or 12V switch configuration)
T12: “Tonadder” (12V) “optional”

Remark: Contact AETA AUDIO S.A. or your local dealer to enable T12 option.

On each channel can be applied a selectable 12 dB/octave high-pass filter (Off / HP) by menu configuration.[1]

For each input channels there are a mute enable by menu.

The gain of each input can be individually adjusted using the corresponding front panel potentiometer (Figure 1 - Front panel, Ref. 2 & 3) . When the potentiometer is in the leftmost position, the associated input is muted (–80dB attenuation).

If the limiter or compressor is enabling in the menu, the mixed signal is processing.

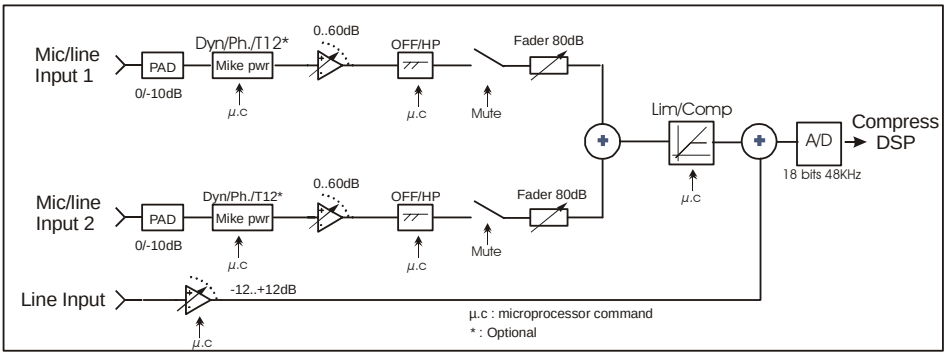


Figure 6 - Analog Inputs

[1] See audio menu section page 25

Format	symmetrical
Connector	3-pin female XLR socket
Microphone powering	Phantom 48V or 12V, optional Tonadder 12V
Maximum input level with pad	+21 dBu
Input stage sensitivity adjustment	+0 to +60 dB by 4 steps of 20dB
Input impedance	10 kΩ
CMRR	>80dB @ 1kHz

Table 1 – Input interface

5.2.2. Outputs Interface

On the right panel you have the line input connector and the line output connector. The input line signal is mixed with the mic/line inputs after the limiter / compressor, see figure 8.

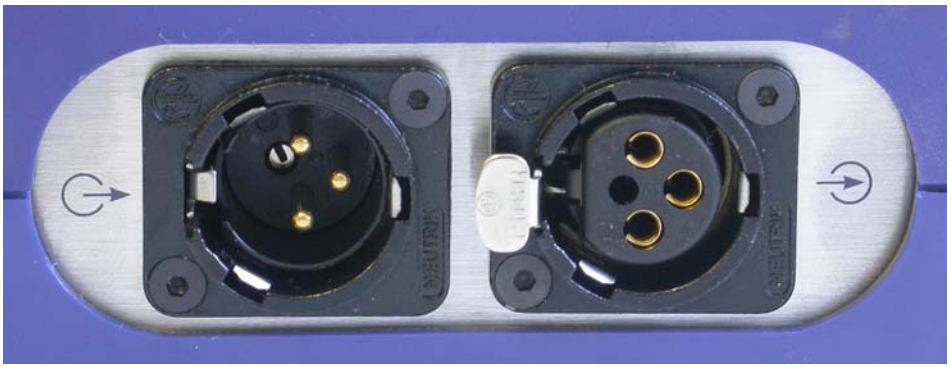


Figure 7 – Right panel

Line input :

Format	Symmetrical
Connector	3-pin female XLR socket
Maximum input level	+21 dBu

Input stage sensitivity adjustment	Mute,-12 to +12 dB by steps of 1dB (software selection)
Input impedance	10 kΩ
CMRR	>80dB @ 1kHz

The audio signal output is available on the two headphones and on the line level output.

Local audio from the inputs can be mixed with the return audio signal on each headphone. The return audio signal is present in the headphone mix via the Local / Cue Mix Balance potentiometer on the front. (See Page 7: Figure 1 – Front panel, ref. 1 & 4).

By default, the return program audio is assigned to the output line. You can assign local audio program or the headphone 2 mixed audio signal to the output by menu[1].

Line Out Interface:

Format	Symmetrical
Connector	3-pin male XLR socket
Maximum Output level	+0 to +22dBu by step of 1dB (software selection)
Output impedance	≤ 50 Ω
Output symmetry	> 40 dB

Headphone Interface :

Connector	6.35mm jack socket
Maximum output level	+20dBu
Output impedance	≥ 16 Ω

[1] See audio menu section Page 25

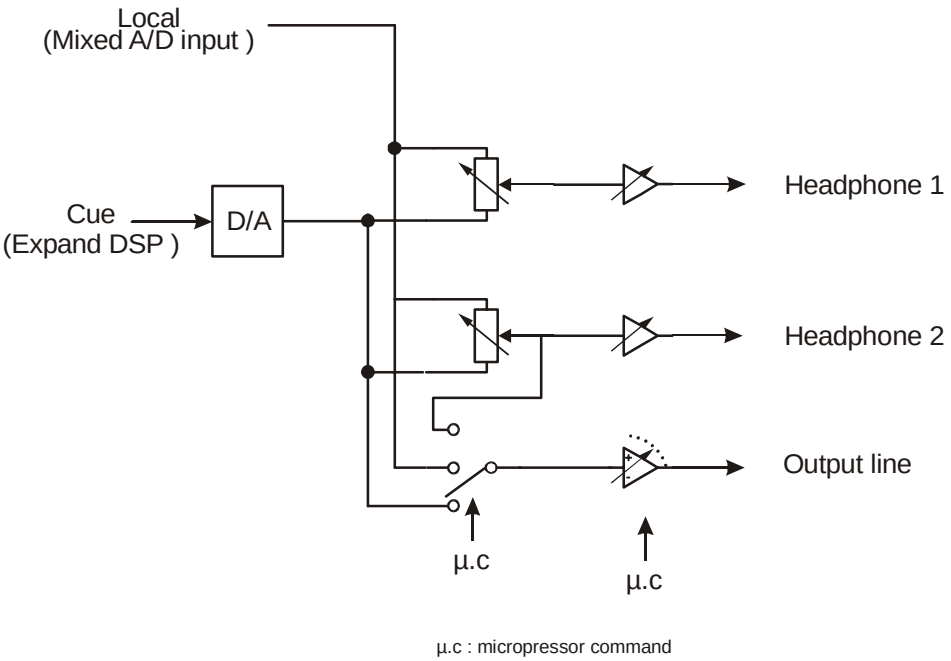


Figure 8 – Analog outputs

5.2.3. Stereo mode

In ISDN mode, Scoopy can be configured in stereo. In stereo mode, the input 1 is the left channel and the input 2 is the right channel. This mode can be enabled by menu, see menu 3 – audio part.

Rem.:

- The limiter / compressor and faders (input adjustment on front panel) are disabled in this mode.
- Only MPEG Layer 2 can be used in stereo mode for transmission.

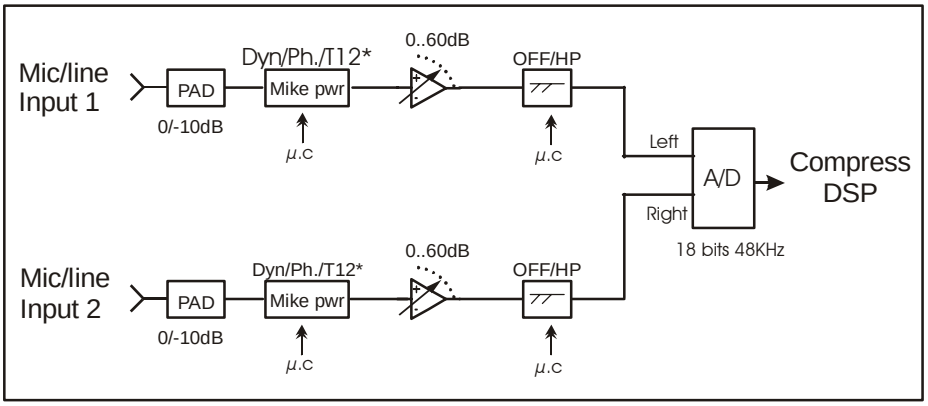


Figure 9 – Analog inputs

Regarding the monitoring, send and receive stereo signal is only available on the headphone 1. On the others output, only left signal (receive or send) is available. The bargraph display the higher peek of both channels.

5.3. Audio performance

A) Analog performance

Measurement condition:

- AD/DA Loop
- Sampling frequency: 48kHz

Maximum Gain (Input to Output)	+87dB
Signal to Noise ratio	84dBrms
Bandwidth	20Hz – 20 000 Hz ± 0.5dB
Distortion (THD+N)	< 74 dB (0.02%) @ 950Hz

Table 2 – Audio performance

B) In ISDN mode

Data rate	Sampling frequency	Bandwidth	Delay	Algorithm
128 kbit/s	48kHz	20Hz - 20kHz	137ms	MPEG Layer II
128 kbit/s	32kHz	20Hz – 15kHz	202ms	MPEG Layer II
128 kbit/s	24kHz	20Hz – 10.4 kHz	268ms	MPEG Layer II
128 kbit/s	16kHz	20Hz – 7.2 kHz	398ms	MPEG Layer II
128 kbit/s	32kHz	20Hz – 15 kHz	7ms	4SB ADPCM
64 kbit/s	48kHz	20Hz – 20kHz	163ms	MPEG Layer II
64 kbit/s	32kHz	20Hz – 13.4kHz	202ms	MPEG Layer II
64 kbit/s	24kHz	20Hz – 10.4 kHz	268ms	MPEG Layer II
64 kbit/s	16kHz	20Hz – 7.2 kHz	400ms	MPEG Layer II
64 kbit/s	32kHZ	20Hz – 15kHz	80ms	TDAC
64 kbit/s	16kHz	20Hz - 7kHz	11ms	G722 SRT/H242
64 kbit/s	16kHz	300Hz – 3.5kHz	17ms	G711- phone

Table 3 – ISDN mode

Note: In MPEG Layer II without J52, Scoopy is compatible with other manufacturer codecs.

C) POTS mode - CELP Algorithm

Data rate	Audio quality
12Kbit/s	3.6kHz
14.4Kbit/s	4.3kHz
16.8Kbit/s	5.1 kHz
19.2 Kbit/s	5.7 kHz
21.6 Kbit/s	6.3 kHz
24.0 Kbit/s	**7.2 kHz**

Bandwidth : 40 Hz to 7 kHz (@ 24 kbps data rate)

24 kbit/s can typically be achieved in all countries that support V.34 modems on their public switched networks.

The CELP algorithm is optimized running at 24 kbit/s.

Table 4 – CELP

Note : CELP is a proprietary algorithm of France Telecom CNET

5.4. Audio monitoring

The 12 LED's labeled “level” on the front panel of the Scoopy indicates the peak level of the mixed audio signal**.** The level display reference (0 dB) is 12 dB below the clipping level.

6. SCOOPY operation: How it works

6.1. Introduction

Incoming audio into the Scoopy is digitized by a state-of-the-art A/D converter and processed through the Scoopy's codec. The data is then sent via the internal ISDN or POTS synchronous modem to the telephone network (ISDN or POTS) to a remote Scoopy or another compatible ISDN or POTS Audio Codec. Operating with a very fast DSP, the codec runs an algorithm modeling the digital audio signal, in order to reduce the digitized audio data rate.
At the other end of the telephone network, the answering Scoopy reconstructs the original audio signal with very little loss or induced artifacts and at an extremely low audio delay time.

6.2. User interface

The user interface consists of a lexan matrix keypad and a LCD display. The keypad has two sections.

- The first section is a 4x3 matrix including the numbers from 0 to 9,"*", "#".

  Some keys have many functions:
  2, 3, 4, 5, 6, 7, 8, 9, 0: for accessing to letters display on the key, press the key several times.
  Note: Space character is available on the "1" key.

- The second section is the Extended Keypad functions under the display.
  There are 3 function keys not labeled. The key function depends on the menu; the function label appears over the key on the second line of the display

- The third section is the special Keypad functions.

  Key to validate a choice.

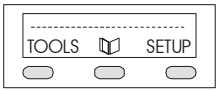
  Key to escape from a menu.

  
  "Green phone", key to make a call.

"Red phone" key to on hook a call.

6.3. Scoopy MENU

1) Main menu



To scroll in the sub-menus use the keys under the word
If a second sub-menu exists, you can enter by pressing again the key under the word

At any time you can return to the main menu by pressing the ESC key.

Note: the symbol between "TOOLS" and "SETUP" means : "DIRECTORY"

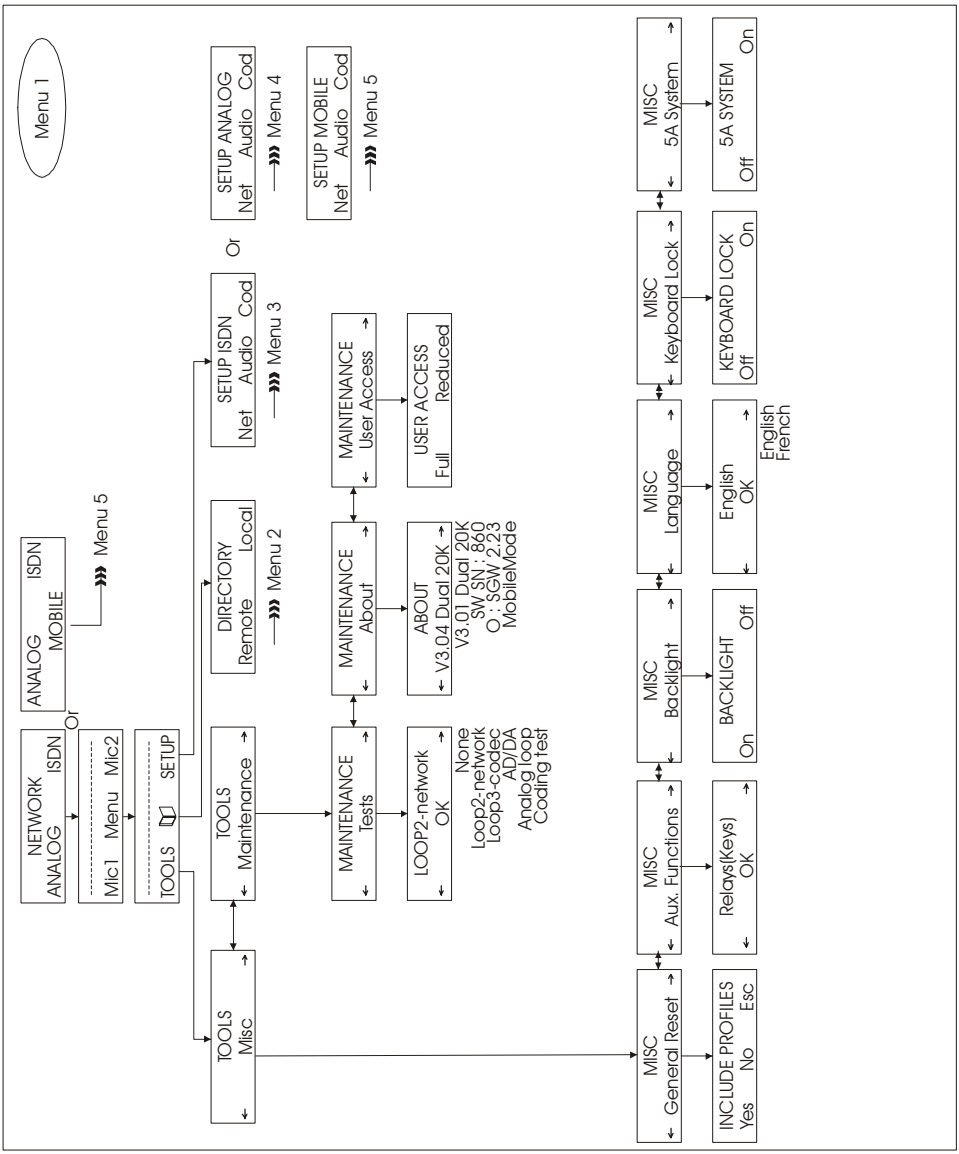
If you press "green phone" key, you access to the 5 last called numbers.
If you enter a letter, you access to the remote directory.
If you enter a number, you can make a direct call.

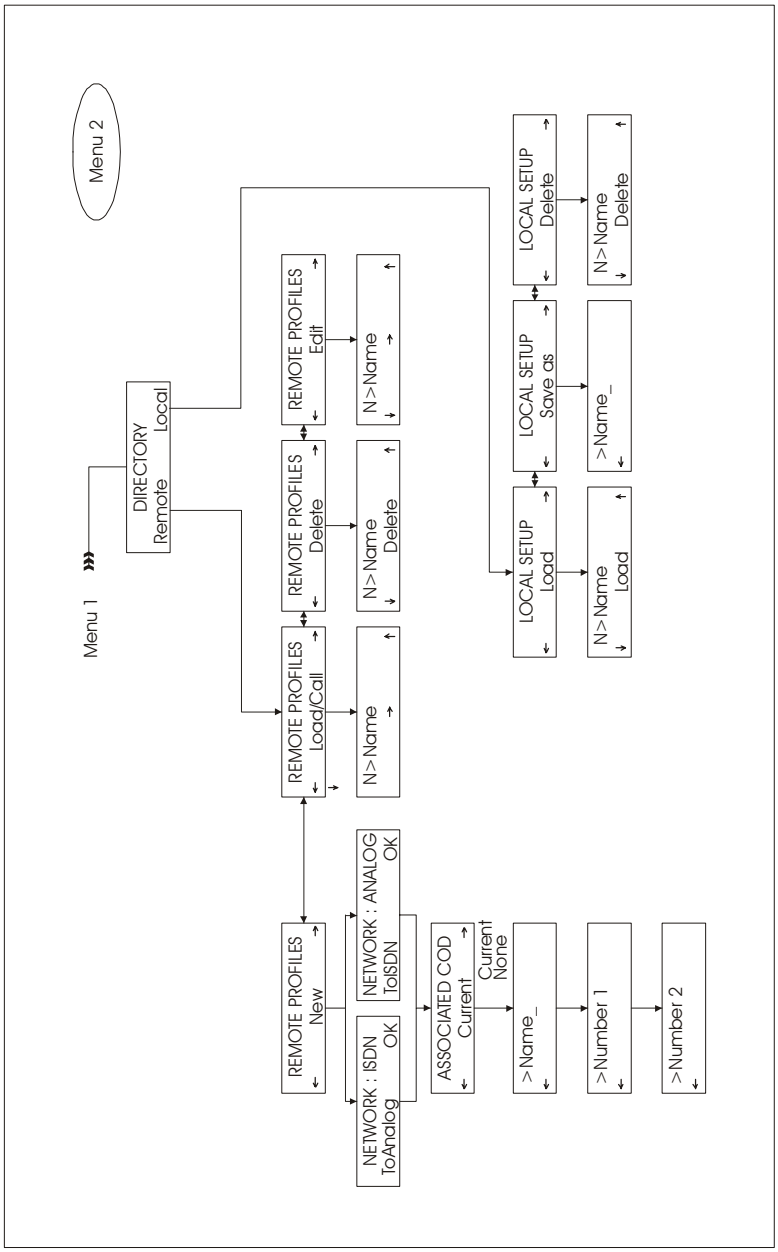
Note: If you have a restricted menu, you can disable it by pressing the directory key and this following sequence: "1","6","4","3"

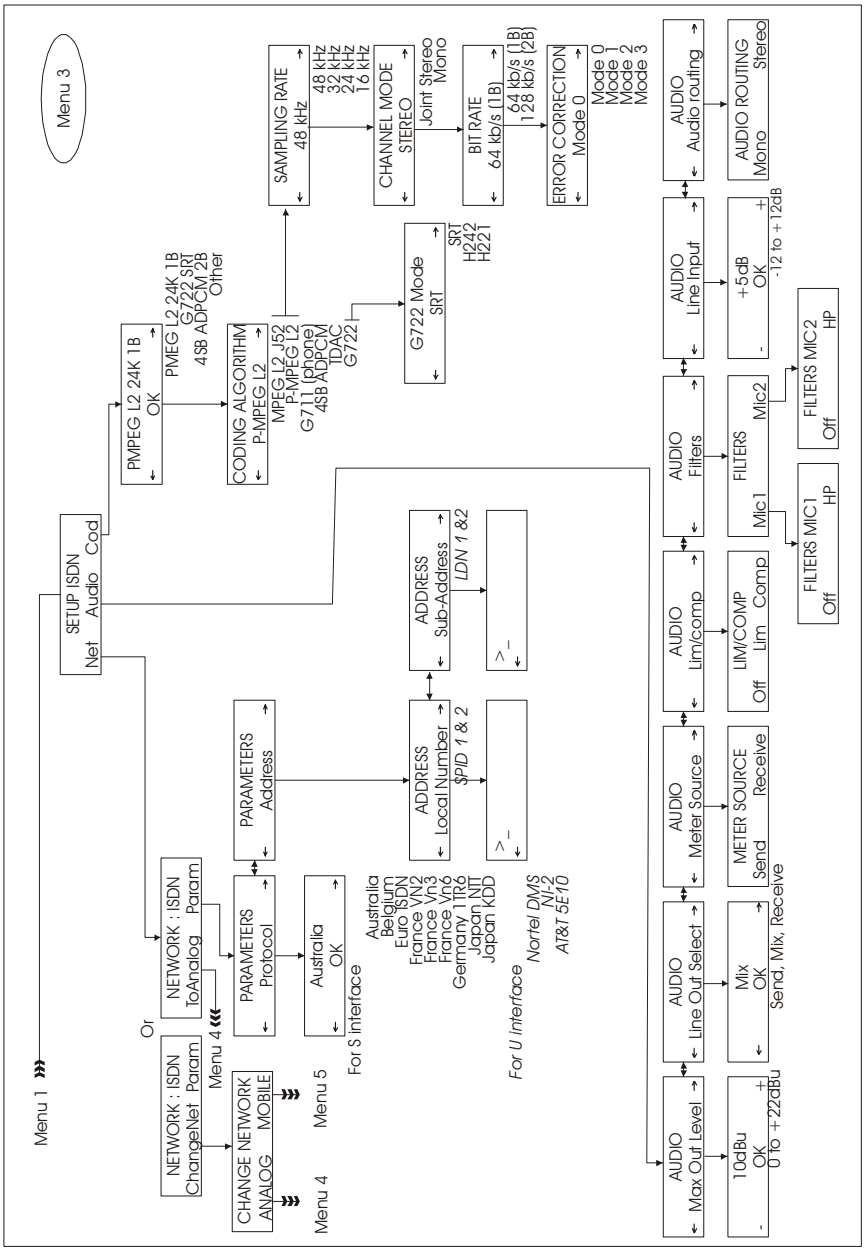
6.3.1. Scoopy default configuration

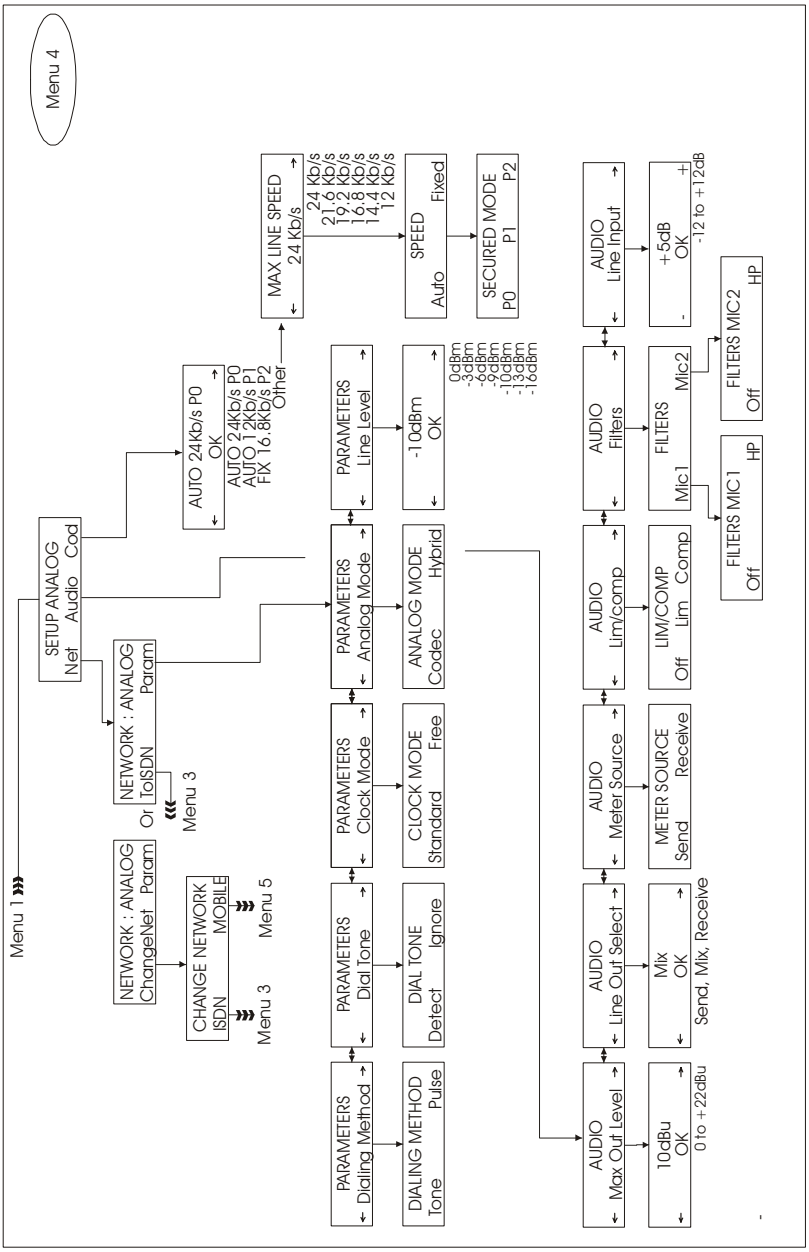
The Scoopy's "General Reset" (set default configuration) is useful to configure the modem in case communication difficulties are encountered.

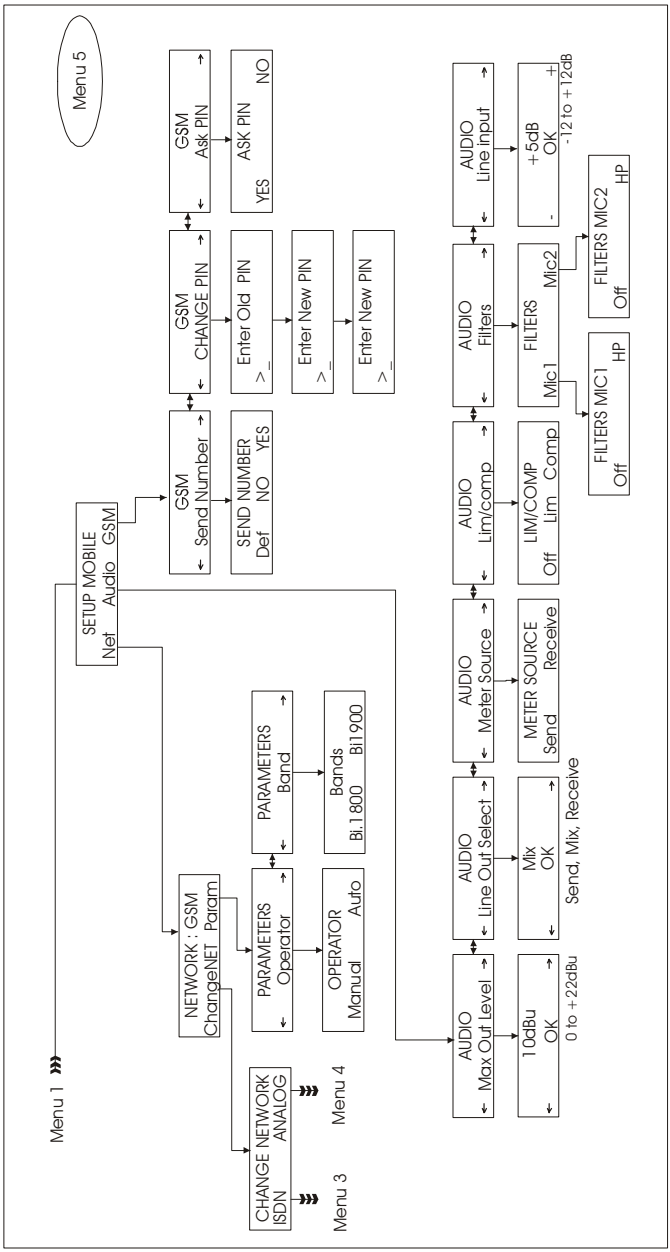
Note : The stored calling numbers are erased when you make a General reset.











7. How to Set-Up Profiles on the Scoopy

You can access and edit memory locations and Profiles directly from the front panel keypad and menus of the Scoopy. The Scoopy has the ability to allow you to pre-program the 100 Profile locations.

7.1. What is a profile?

A profile is a non-volatile, pre-programmed memory location stored within the Scoopy which functions very similar to the auto dial memory locations on an average telephone.

A remote profile can contain an ISDN or POTS number with specific parameters associated with that number. The remote profile can contain the name of the location to be dialed and its specific algorithm. You can create up to 50 unique remote profiles on the Scoopy. If the remote profile is an ISDN type, you can have two numbers stored (one number for each B channel).

A local profile (named local setup for making the difference) can contain ISDN or POTS local parameters. The local setup can contain the name and all network parameters like local address in ISDN. You can create up to 50 local setups on the Scoopy

7.2. How to manage profiles on the Scoopy

Note: All remote profile can be a POTS profile or an ISDN profile.

7.2.1. How to manage remote Profiles

From the Main Function Menu, select “DIRECTORY” symbol, and press the key under it. After having selected “REMOTE” choice, you can select different actions:

- “Load” for loading in memory a profile.
- “Delete” for deleting a profile.

- “Edit” for looking each elements of the profile.
- “New” for creating a new profile.

“Load”

With the left and right extended display key, you can scroll the remote profiles. If you enter a letter on the keypad, the profile list scroll to the profile whose the name begin with this letter.

With the center extended display key, you scroll each profile items.

For calling with the displayed profile, you have just to press the “green phone” key.

For loading in memory the profiles, press the “OK” key.

“Delete”

With the left and right extended display key, you can scroll the remote profiles. If you enter a letter on the keypad, the profile list scroll to the profile whose the name begins with this letter.

With the center extended display key, you delete the display profile

“Edit”

With the left and right extended display key, you can scroll the remote profiles. If you enter a letter on the keypad, the profile list scroll to the profile whose the name begins with this letter.

With the center extended display key, you scroll each profile items.

Press “OK” key to modify one or many items of the display profile.

“New”

At first you should select the network: Analog/POTS or ISDN.

After that, you have the choice to associate an algorithm (current algorithm configuration) or not to your profile. If you don’t associate an algorithm to your profile, when you will make a call with this profile, scoopy will use the current algorithm configuration.

The next stage is to enter a name for your profile, and press “OK” to valid.

Now, Scoopy asks the user to enter one or two numbers (depending on algorithm configuration). If you don't enter numbers, when you will make a call with this profile, Scoopy will ask you to enter the numbers.

7.2.2. How to manage local setups

From the Main Function Menu, select "DIRECTORY" symbol, and press the key under it. After having selected "LOCAL" choice, you can select different actions:

- "Load" for loading in memory a local setup.
- "Save as" for creating a new local setup.
- "Delete" for deleting a local setup.

In a local setup memory we save the current network configuration.

For example: If you are in ISDN, we save the ISDN protocol, the local address and the local sub-address.

8. Connecting 2 SCOOPY

Note: The following is valid for both POTS and ISDN mode.

Warning: In ISDN mode with some PBX's, you must enter your local number and your SPID number prior making a call.

8.1. Initiating a call

There are 3 ways to initiate a call:

- Dialing with a profile
- Direct Dialing
- Re-dialing the previous number.

8.1.1. Dialing Using a Profile Number

From the Main Function Menu, select "DIRECTORY" symbol, and press the key under it. After having selected "REMOTE" choice, press the key under "Load".
Note: You arrive directly in the remote profile list, when you enter a letter under the main menu.

Select the profile number and press "Green phone" key.

"Call XXXXXXXX" appears on the screen and is dialed automatically.

8.1.2. Direct Dialling

Enter the telephone number and press the "green phone" key. If you call twice same number (In ISDN), you need to press again the same key.

Note: In the case that you have 2 numbers, if you don't enter the second number, we call twice the first number.

A message to indicate that the call is in progress is displayed on the screen.

Note:

- *The number length is limited to 23 digits and may be displayed on 2 lines.*
- *Insert a "∗" between number and sub-number in ISDN mode.*
- Insert a "∗" for wait in POTS mode

8.1.3. Re-Dialing the Previous Number

From the main menu, press "green phone" key, the last called number appears on the screen; press again the "green phone" key. Actually, you are in a short list of the five last called numbers.

"Call in progress" along with the redialed number is displayed on the screen.

Note: We don't re-load configuration, we use the last configuration used (current now).

Note:
In case of mistake you may come back at the beginning of the menu by pressing the "Esc" key.

Note:
As soon as the local and remote Scoopy are connected, the CONNECT result code is displayed.
If a connection cannot be established, the NO CARRIER result code will be displayed.
The bit rate is displayed in POTS mode.

8.2. Disconnecting a call

To end a call, press the "red phone" key.
"Wait..." is displayed, after awhile, the Scoopy is ready for the next call.
The main menu appears on the screen.

8.3. Auto Answering

As soon as the "Power on Initialization" phase is completed, the Scoopy is ready to receive an ISDN call or a POTS call. You have just to adjust the levels in such a way that the audio level green and yellow LED's indicate a normal operating range.

When a call is received, the Scoopy automatically recognizes ISDN or POTS and establish the connection. Adjust your headphone level and your local feedback with the local/return mix balance if needed.

Then the Scoopy is ready for full duplex audio communication.

8.4. Entering local Numbers

From the Main Function Menu, go to “SETUP”, “NET”,”PARAM”. Use the right arrow key to scroll to "Address" screen. Press the center key to enter in address configuration

You have two-address configuration with each sub-address. You have a specific address and sub-address for each B ISDN channel.

A series of AT commands will be displayed and automatically return you to the main menu

***Note**: In many case, the sub address is not necessary*

8.5. Entering SPID Numbers (USA)

In the USA, some ISDN circuits require two SPID numbers and two LDN (Local directory number), one SPID for each B channel, in addition to the local dialing number. The Scoopy can be manually programmed using the keypad.

From the Main Function Menu, go to “SETUP”, “NET”,”PARAM”. Use the right arrow key to scroll "Address" screen. Press the center key to enter in address configuration

Note:

- You should enter SPID 1 and LDN 1 local number at first
- Generally, the LDN is the 4 last digits of the SPID number.

9. POTS Information

9.1. Factory default configuration

The Scoopy's factory-set default configuration is suitable for most Scoopy transmission applications and are reloaded by the selected function:
“TOOLS”, “Misc”, ”General reset”.

Your Scoopy is designed to operate over dial-up phone circuits with the following dialing and call monitor features:

- Multi-frequency signaling (Tone dialing method) or
  Loop-disconnect signaling (Pulse dialing method)

Remark:
By issuing the configuration procedure the user can change the
<Dialing method>: Pulse or Tone
The selection of the dialing method will be stored until the user has to modify his choice again even when the Scoopy is power off.

- Operation in the absence of proceed operation (waiting for dial tone)
- Automatic answering
- Originating and answering handshake negotiations begin at the highest DCE line speed configured in the factory (24 kbps) or at lower speed selected by the menu with the current configuration.
  Automatic speed selection: Handshake negotiations fall back to a lower speed if necessary.
- Full dial progress detection (Dial tones detect).

Rem: This parameter must be "disable" for calls originated from Switzerland and Italy.

Additional setting

- Fall back if negotiation fails at the highest speed (speed automatic)
- Maximum DCE Line speed = 24000 bps. (Default configuration)

9.2. POTS modes

9.2.1. Phone / Codec Mode

The menu «ANALOG MODE» selects the telephone mode or the codec mode. If you select Hybrid parameter, you select the phone mode.

The change of the initial mode can't be done during the communication.

When the high-speed connection is broken the Scoopy doesn't fall back to the regular POTS mode (3.4 kHz). The voice communication is interrupted and a new call has to be made.

9.3. Network parameters

9.3.1. Setting the optimal rate

The Scoopy with the lowest max line speed setting will determine the maximum connect rate.

a) When the speed mode function is set on "Automatic" adaptation (general reset Configuration) both modems will negotiate the highest transmission rate according to the quality of their current respective networks.

   This rate is also limited at the lowest speed of the two max speed selected on the 2 units.

   If the line quality is changing during the audio-transmission the modems will try to adapt consequently the data rate by fall back at a lower data rate and fall forward to the higher selected speed. During each re-negotiation the audio signal may be interrupted. If these "break down" appear, it is highly recommended to set the max line speed selection of one of the Scoopy at one level or two below the used connect rate.

b) When the speed function is set on "Fixed" at ONE of the both Scoopy unit, the 2 modems will be allowed to negotiate at only the lowest speed of the two max speeds selected.

They will neither "fall forward" nor "fall back".

If this select speed is too high for the possibility of one of the local network capacity, the modem will "NOT CONNECT" and a lower speed has to be selected by the user to obtain a solid connection at a reliable data rate.

Rem: By setting Speed fixed, the user has the ability to select the max/min connect rate for the modems before a call is placed. So the fall back to a lower speed cannot occur during the communication.

9.3.2. Clock Mode

For long distance transmission, it is better to set on free this parameter. The reason is : in this mode, each modem generates the transmit clock and generate receive clock from receive carrier signal. In this case, each way is separated.

In standard mode, each modem works with only one clock. The local Scoopy generates the clock and the remote generates its clock from receive carrier signal.

9.3.3. Line level

The phone line level is depending on country where you are. You can adjust the phone line level between 0dBm to –16dBm. The most popular level is –10dBm (default value).

9.4. Error protection

This function reduces the short and occasional transmission errors causing glitches and dropout in the audio. Those errors can be founded particularly on long distance circuits and when connected to an in-house phone systems.

The audio quality could be slightly affected.

The user will only hear a short additional delay.

9.4.1. Secured modes

Three protection modes are available:

Protected 0 (Unprotected) is set by default (Factory Configuration)

- Is compatible with all Scoopy units.
- Keep the smallest transmission delay (coding: decoding) of 88 ms at 24Kbits.

Protected 1

Ought to be selected manually and recovers errors of 100 ms.

Protected 2

Ought to be selected manually and recovers errors of 250 ms.

Delay:

Protection \ Data rate	24K	21.6K	19.2K	16.8K	14.4K	12K	Coding Test
P0	88ms	90ms	105ms	114ms	131ms	138ms	55.5ms
P1	293ms	320ms	348ms	394ms	456ms	535ms	255ms
P2	581ms	647ms	723ms	823ms	961ms	1146ms	553ms

Note: If errors still exist in protected mode 2, set the max line speed at the next lower speed.

Caution: **The same protection level configuration must be selected at the both end units.**

10. USB function

How to enable USB function?

- USB Audio can be enabling in Setup-Audio menu. In Audio I/F (Audio Interface) mode, the scoopy has the same functionality as PC sound card. In normal mode, the PC is the fourth input for the mixer and the PC can record mixed signal and remote audio signal when you are connected on mono over a network. (See next schematics for more details).

Is it possible to use the USB interface in stereo?

- Yes, if you have the stereo option in your scoopy.

What USB driver should be used?

- Scoopy is seeing like a generic audio codec, you don't need to install specific driver. It can be connected to a PC under windows 98/ME/2000/XP.

What audio formats are available?

- audio codec works in 16 bits at
  - DAC: 32, 44.1, 48 kHz
  - ADC: 8, 11.025, 16, 22.05, 32, 44.1, 48 kHz

Where can I select sample frequency?

- Under yours audio recorder software, (sample frequency is managing by the PC)

Where can I manage send and receive audio level?

- From your audio software or with the audio wave mapper. Be careful, by default output level is not set to the maximum

What sort of connector scoopy use? Mini-B like camera

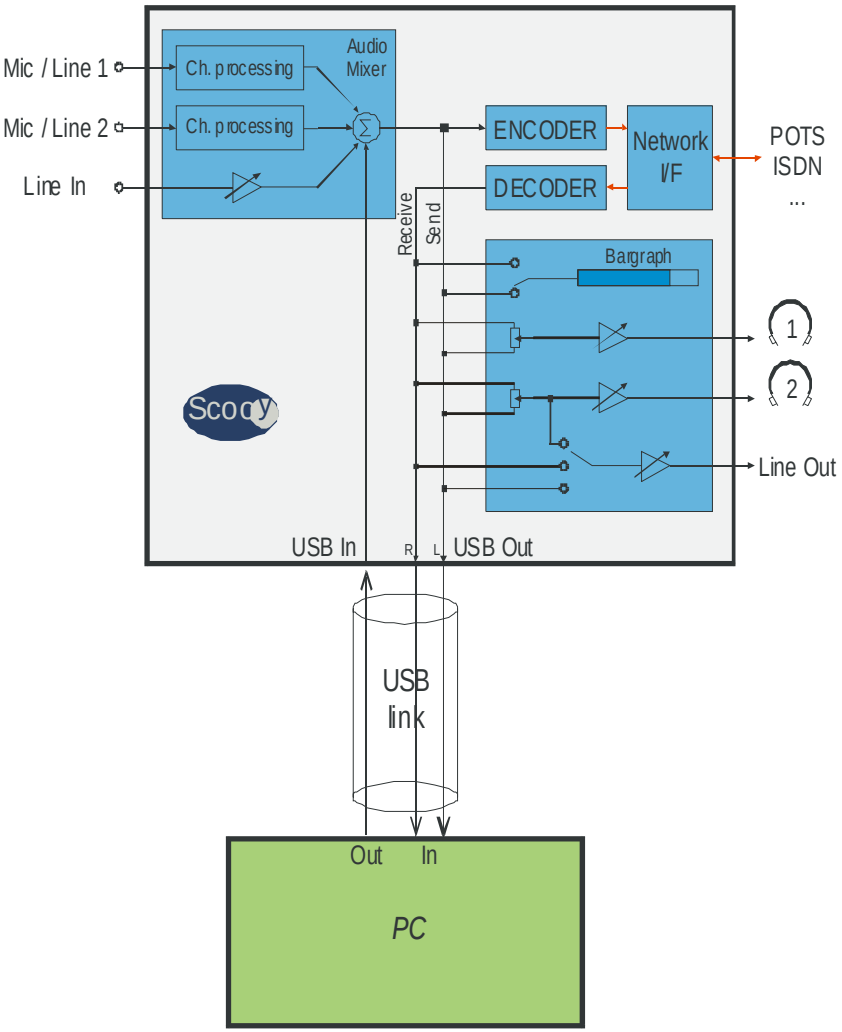
Can I connect a memory key on the USB connector?

- No, Scoopy is a device peripheral; it can't be used as a host.

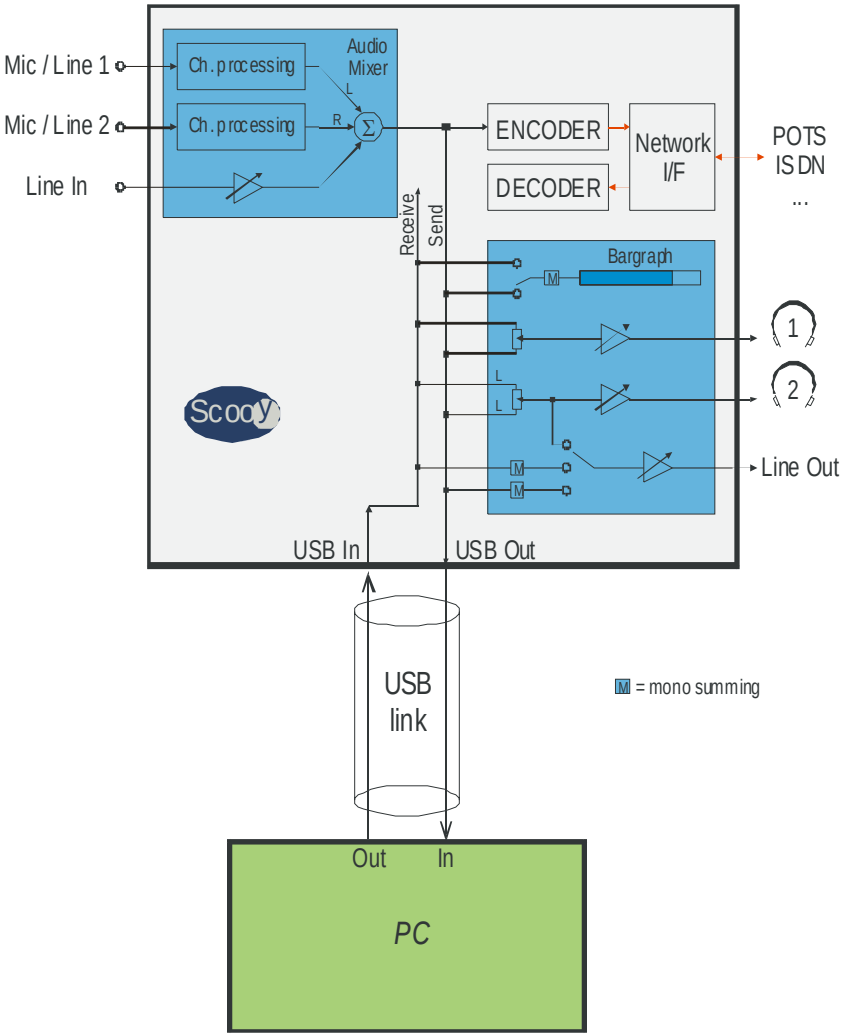
Can I transmit compressed audio data through the USB link?

- No, you can transmit only linear audio.

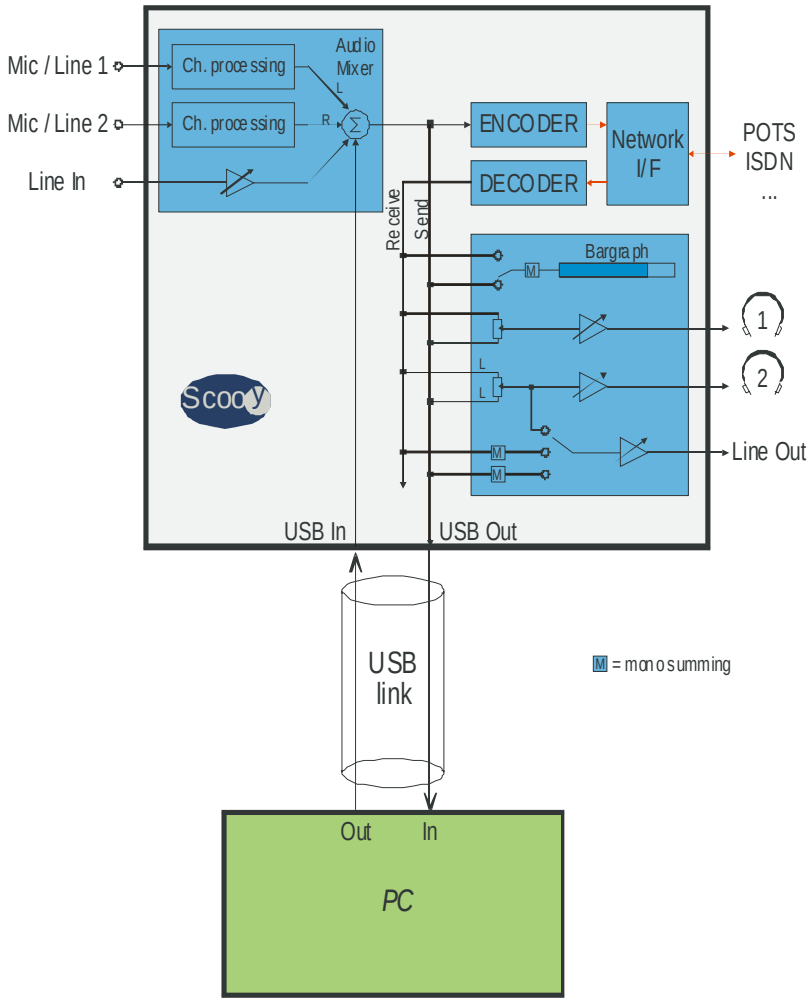
Normal mode - Mono audio routing



“ Audio Interface “ mode



Normal mode - Stereo audio routing



11. Troubleshooting

Power supply failures:

If running on batteries, check that batteries have been inserted properly. Check the "Battery" Green LED indicator on the front panel. The green LED indicates that the battery level is higher than 20%. When the battery LED goes "off", the remaining autonomy of the Scoopy is 15 minutes.

A set of 6 new batteries will last approximately 1 hour 30 communication in normal operating conditions.

Note: Replace the old batteries before each new broadcast. Always remove batteries when worn out or when storing the unit for an extended period.

Network Indication:

- Alarm (red)

  "ON" indicates a network problem.
  Check your network.

- Dec (green)

  When "on" indicates that the signal is decoded by the Scoopy.

Unable to establish a connection:

Check the RJ connection between the Scoopy and the telephone network. (RJ 11, identified as Tel on the rear panel of Scoopy for POTS, and RJ45, identified as ISDN on the rear panel of the Scoopy for ISDN)

Connection In ISDN mode

To test your ISDN line, you may connect an ISDN phone or other suitable ISDN verification device into the RJ45 connector instead of the Scoopy and call an ISDN number to verify a working ISDN line. Check the ISDN protocol, check the number, and check appropriate setting if going through a PBX.

Connection In POTS mode

To test your POTS line, you may connect a normal phone to the wall connector instead of the Scoopy unit and call a normal phone number. Check for proper POTS line settings: Dialing method, " Pulse/Tone", dial tone "Detect/Undetected". Check proper setting if going through a PBX (you may need to dial to get an outside line, Ex 9*).

If the Scoopy disconnects while on-line, check for loose connections between the Scoopy and the telephone connection. Line noise or interference may be interfering with the modem signals. Retry the connection by dialing the number again.

12. Tests

12.1. Audio section testing

1- Analog section test

a) Connect an audio signal to one of the audio inputs. That signal is available on the headphones (Potentiometer turns that feedback feature off when fully counter-clockwise).

b) Select the menu < **TOOLS** > , < **MAINTENANCE** > , < **Test** > : **AD/DA Loop**.

The test is OK if you get the audio signal either on the headphones, or Aux. Out.

To end the test go back to the test menu, disable the **AD/DA Loop** by pressing the “none” choice (The star appears on none configuration).

2- Digital and analog parts
The encoder may be connected to the decoder locally to test digital circuits.

Connect and select an audio signal to any of the inputs.
Select the menu < **TOOLS** > , < **MAINTENANCE** > , < **Test** > : **Coding test**.

The test is OK if you get the audio signal either on the headphones, or Aux. Out.
To end the test press the "**Esc**" key, then the unit returns to standby**.**

12.2. Network test

These allow checking the network and the remote codec.

1- The unit can be configured to loop back to the network the received data.

Select the main menu < **TOOLS** > , < **MAINTENANCE** > , < **Test** > : **Loop 2 - Network**.

The loop is enabled as soon as the unit is connected.

2- The unit can be configured to loop back to the network the sent data.

Select the main menu < **TOOLS** > , < **MAINTENANCE** > , < **Test** > : **Loop 3 - codec**.

The loop is enabled as soon as the unit is connected.

13. ISDN modem information

13.1. ISDN Protocols

ISDN modem supports worldwide ISDN signaling (CCITT I.430, Q.921, Q.931) for voice/audio and data including the following network operator variants :

With USA software

- AT&T 5^E5, 5^E9, 5^E10
- Northern Telecom (DMS-100),
- National ISDN-1 and 2 (North America),

With other countries software

- France Telecom EuroNumeris (Vnx) with supplementary services,
- Deutsche Telekom 1TR6 and EuroISDN,
- NTT INS-64 (Japan),
- KDD ISDN (Japan),
- Telecom Australia Austel TS-013,
- All EuroISDN carriers (Austria, Denmark, Holland, Ireland, Italy, Norway, Portugal, Spain, Switzerland, United Kingdom,...).

13.2. ISDN CLEARING CAUSES

The following table lists the call clearing causes (returned for example in a **CLEARED:** message). Call clearing cause is in hexadecimal. Message meaning is given for an **ETSI ISDN**. Causes with values greater than 80 hex are generated internally.

01 (1)	unallocated (unassigned) number
02 (2)	no route to specified transit network
03 (3)	no route to destination
06 (6)	channel unacceptable
07 (8)	call awarded and being delivered in an established channel
10 (16)	normal call clearing
11 (17)	user busy
12 (18)	no user responding
13 (19)	no answer from user (user alerted)
15 (21)	call rejected
16 (22)	number changed
1A (26)	non-selected user clearing
1B (27)	destination out of order
1C (28)	invalid number format
1D (29)	facility rejected
1E (30)	response to STATUS ENQUIRY
1F (31)	normal, unspecified
22 (34)	no circuit/channel available
26 (38)	network out of order
29 (41)	temporary failure
2A (42)	switching equipment congestion
2B (43)	access information discarded
2C (44)	requested circuit/channel not available
2F (47)	resources unavailable, unspecified
31 (49)	quality of service unavailable
32 (50)	requested facility not subscribed
39 (57)	bearer capability not authorized
3A (58)	bearer capability not presently available
3F (63)	service or option not available, unspecified

41 (65)	bearer capability not implemented
42 (66)	channel type not implemented
45 (69)	requested facility not implemented
46 (70)	only restricted digital information bearer capability is available
4F (79)	service or option not implemented, unspecified
51 (81)	invalid call reference value
52 (82)	identified channel does not exist
53 (83)	a suspended call exists, but this call identity does not
54 (84)	call identity in use
55 (85)	no call suspended
56 (86)	call having the requested call identity has been cleared
58 (88)	incompatible destination
5B (91)	invalid transit network selection
5F (95)	invalid message, unspecified
60 (96)	mandatory information element is missing
61 (97)	message type non-existent or not implemented
62 (98)	message not compatible with call state or message type non-existent or not implemented
63 (99)	information element non-existent or not implemented
64 (100)	invalid information element contents
65 (101)	message not compatible with call state
66 (102)	recovery on timer expiry
6F (111)	protocol error, unspecified
7F (127)	interworking, unspecified
91 (145)	no signaling data link establishment
A2 (162)	no line activation
FF (255)	call clearing, unspecified

14. How to open a SCOOPY ready for servicing

Tools required:

Philips Screw Driver (medium-sized)

The Scoopy will be now separated into three Sections:

1) The rear metal panel
2) The bonnet
3) The casing lid

Steps :

- Switch to off Scoopy
- Remove the external mains power cable and batteries
- Undo the two screws at the back.(under the metal rear panel)
- Remove the rear panel

At this stage, you can change the ISDN board, there are no fixations, and the board is just plug into a connector

- Undo the four screws under the Scoopy (located in wells).
- Remove the bonnet.

Now, you have access to all internal boards.

15. Connectors layout

15.1. Remote Connector

This interface uses a 9-pin female Sub-D connector on the rear panel. This is a V24/RS-232 type interface with only Tx and Rx signals (no flow control). The following table indicates its pin out (DCE type pin out)

Pin	Description
2	TX , To the PC
3	RX, From the PC
7	CTS, From the PC
8	RTS , To the PC
5	Signal ground

15.2. POTS Interface

The telephone network connection on Scoopy is a RJ 11 connector. (Labeled Analog)

Connector:

Pin	Description
1	-
2	TIP
3	RING
4	-

Impedance adaptation (Internal rear panel switches):

Country	RZDC	ZZNT
US	8.2 Ω	600 Ω
CTR-21	22.1 Ω	600 Ω//0.0047µF

Country \ Switch	1	2
US	ON	OFF
CTR-21	OFF	ON

15.3. ISDN Interface Network

The ISDN connector is a RJ45 – 4 wires into 8 wires.

S0/T0 Network:

Pin	Description
1	N.C.
2	N.C.
3	TX A, To the network
4	RX A, From the network
5	RX B, From the network
6	TX B, To the network
7	N.C.
8	N.C.

U0 NETWORK:

Pin	Description
1	N.C.
2	N.C.
3	N.C.
4	RING
5	TIP
6	N.C.
7	N.C.
8	N.C.

15.4. Environment

Operating temp. Range:	0°C to 45°C (41°F to 113°F)
Humidity:	0 to 90% non -condensing
Storage temp. :	- 20°C to 60°C (-4°F to 140°F)
Dimensions:	(D x W x H) 234 x 155 x 80 mm
Weight:	1.5 kg, with batteries