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N40A PROGRAMMER

98-04-13919

FOR

N40 ANALOGUE – HANDSET

Record of Versions

VERSION NO.	ISSUE DATE	INSERTED	
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List of Effective Pages

This list indicates page index and corresponding date for version. Changes are indicated as follow:

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List of Abbreviation

Abbreviation	Definition
AAT	Aircraft Acoustic Tester
CMM	Component Maintenance Manual
dB	Decibel
DTMF	Dual-Tone Multi Frequency
Hz	Hertz
kg	Kilogram
LAN	Local Area Network
LED	Light Emitting Diode
ms	Millisecond
N40A	N40 Handset with analogue audio interface
Pa	Pascal (Sound Pressure Level measured in Pascal)
PNR	Part Number
PU	N40 Programmer Unit
SPL	Sound Pressure Level
USB	Universal Serial Bus
V	Volt
V_{RMS}	Volt $_{\text{Root Mean Square}}$

Contents

Safety Instruction

CAUTION!

The N40A Programmer complies with the relevant international regulations on safety standards. Nevertheless, please read the following safety instructions carefully before taking the N40A Programmer into use. Ignoring the safety regulations includes potential risk and will exclude any responsibility from the manufacturer.

DC supply	The voltage for the external DC supply is 5 V ± 0.25 V (USB or external power supply). Voltage outside this range can cause unsafe operating conditions or result in damage to the N40A Programmer.
Accessories/ Spare Parts	To avoid any damage of the N40A Programmer, only supplied accessories and spare parts by the manufacturer should be used. Otherwise correct operation cannot be guaranteed.
Maintenance/Repair	Any repair and service of the N40A Programmer has to be accomplished by the manufacturer. Otherwise the warranty will expire.
Care and cleaning	To avoid damaging of the N40A Programmer, use only a damp cloth to clean the outer surface of the PA, without adding chemical or abrasive cleaning agents.
Liquids	Keep liquids away from the N40A Programmer.
Calibration	For the N40A Programmer no calibration is required.

1. Introduction

The N40A Programmer is an adjusting device for use by e.g. aircraft operators, service and maintenance providers and/or aircraft manufacturers. It is designed to e.g. re-adjust the N40 Analogue Handset in case of a microphone change.

After a microphone replacement it may be necessary to re-adjust the sensitivity of the handset. The N40A Programmer performs this function to adjust the handset in a few steps.

1.1 Application

The N40A Programmer is applicable to the N40 Analogue Handset series. See following table.

Nomenclature	General PNR	Remark / Configuration
Handset with Support Bracket (Analogue Series: N40A)	N40-1AW0XYY-10X N40-1BW0XYY-10X	A: First Version (superseded by B!) B: GSM-hardened Version W: Colour code for Handset & Support Bracket 1 = Black, 2= Foggy, 3 = Dark Porcelain, 4 = Pepper Dust W: Colour code for Coiled Cord 1 = Black, 2= Foggy, 3 & 4 = Pepper Dust, X = 1: Flight Deck, X = 2: Cabin Y: Keyboard configuration

Table 1: N40A Programmer applicable to N40A Handsets

1.2 Content of delivery

The content of delivery of a N40A Programmer consists out of:

- N40 Programmer Unit
- N40A Programmer Adapter
- Service Cable
- USB Cable

1.3 Spare parts

Spare parts available for the N40A Programmer are listed below:

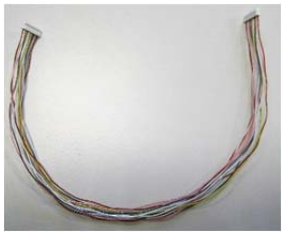
Figure	Description
 *Figure 1: Programmer Adapter*	N40A Programmer Adapter *Spare Part PNR: 14-18-90022* **NOTE:** A Replacement of the *N40A Programmer Adapter* needs to be done after 200 mating cycles. Otherwise the correct operation of the PU cannot be guaranteed.
 *Figure 2: Service Cable*	Service Cable *Spare Part PNR: 10-16-90005* **NOTE:** A Replacement of the Service Cable needs to be done after 200 mating cycles. Otherwise the correct operation of the PU cannot be guaranteed
 *Figure 3: USB Cable*	USB Cable *Spare Part PNR: 30-99-90077*
 *Figure 4: N40A Programmer*	N40 Programmer Unit *PNR 98-04-13894* **NOTE:** N40 Programmer Unit is just mentioned for your information. It cannot be ordered as a spare part. If the unit does not work correctly, please feel free to contact us.

Table 2: Spare parts

2. Description

2.1 Illustration of a N40 Programmer Unit

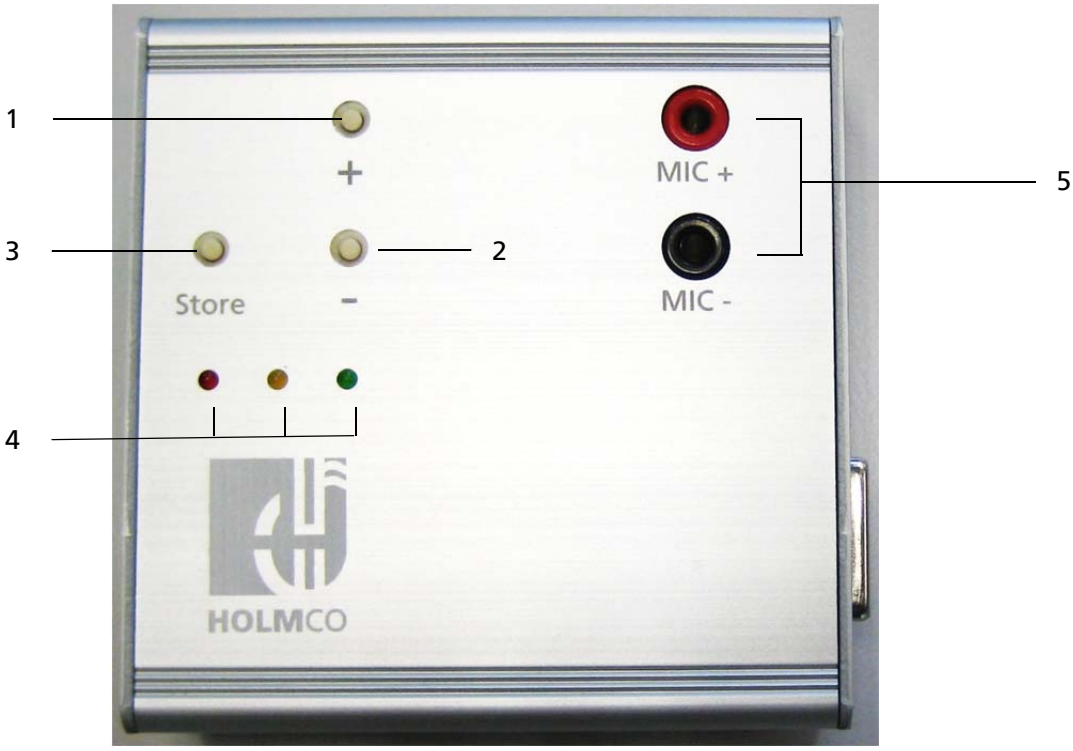


Figure 5: PU – top view

ITEM	COMPONENT	DESCRIPTION
1)	ADJUST BUTTON PLUS "+"	Set N40A Handset in service mode / increase Microphone Level
2)	ADJUST BUTTON MINUS "-"	Set N40A Handset in service mode / decrease Microphone Level
3)	STORE BUTTON	Store adjusted level to N40A Handset Flash and quit service mode
4)	LEDS	Show status of the N40 Programmer Unit (See. Table 3)
5)	4 MM BANANA JACK	Connector for voltmeter or oscilloscope

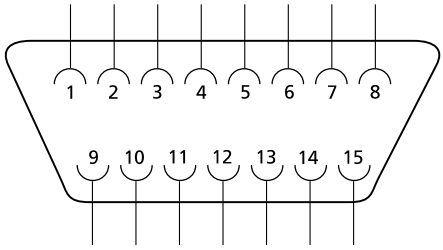
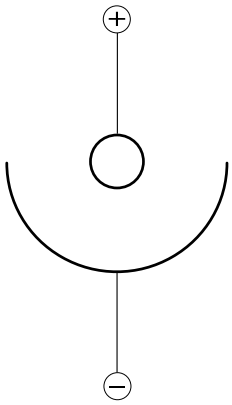
Figure 6: N40A Programmer Unit – front view

ITEM	COMPONENT	DESCRIPTION
6)	D-Sub jack	Socket to connect N40A Programmer Adapter

Figure 7: N40A Programmer Unit – rear view

ITEM	COMPONENT	DESCRIPTION
7)	LAN	For manufacturer service only
8)	USB (micro)	Power supply via PC USB interface or with applicable USB plug
9)	5V DC	5 V ± 0,25 V Power supply / < 500 mA (power adapter only)

2.2 Connector pin assignments

D-SUB 15 PIN "CON 1"	1	MIC +	 *Figure 8: D-SUB CONNECTOR*
	2	MIC –	
	3	RXTX	
	4	PTT	
	5	MISO	
	6	MOSI	
	7	SCK	
	8	RESN	
	9	SP –	
	10	SP +	
	11	PE	
	12	N.A.	
	13	N.A.	
	14	N.A.	
	15	N.A.	
SUPPLY VOLTAGE INPUT "5 V DC"			 *Figure 9: POWER SUPPLY INPUT*
USB	N.A.		FOR POWER SUPPLY ONLY
LAN	N.A		FOR MANUFACTURER SERVICE ONLY

3. Functions

3.1 Microphone Sensitivity Adjustment

The adjustment function (Adjustment Button plus/minus fig.5) sets the microphone sensitivity of the N40A Handset. The N40A Programmer Unit has buttons to increase or decrease the microphone level manually. An attached measurement instrument (voltmeter or oscilloscope) displays the sensitivity level of the connected handset. The adjustment mode is indicated by the green blinking led. It stops blinking when it is back in operation. With the store button the handset is adjusted and set back in its operation mode (assignment of the keys see fig. 5).

3.2 Connection Error

If the connection cable or any other connection components are defective or damaged, the three LEDs start blinking at the same time (See table 3).

In that case, please obey the following instructions:

- Check the connectivity of the N40A Programmer Adapter (fig.1). Disconnect and reconnect it again.
- Check the connectivity of the service cable (fig. 2) to N40A Programmer Adapter (fig. 1) and handset. Disconnect and reconnect it again.
- Restart the N40 Programmer Unit.

NOTE: ***If an error could not be corrected, please contact us.***

3.3 LED Functions

MODE	LED RED	LED YELLOW	LED GREEN
N40 Programmer Unit (PU) is booting (~20sec)	on	on	on
PU ready to operate -no handset connected	on	off	off
PU ready to operate - Handset N40A connected with service-cable - Communication/connection error	blink on/off time: 250ms	blink on/off time: 250ms	blink on/off time: 250ms
PU ready to operate - Handset N40A connected with service-cable - Handset is in operation mode - PTT not pressed	off	off	on
PU ready to operate - Handset N40A connected with service-cable - Handset is in operation mode - PTT pressed	off	on	on

MODE	LED RED	LED YELLOW	LED GREEN
PU ready to operate - Handset N40A connected with service-cable - Handset is in service mode (adjust the microphone sensitivity with the "plus" / "minus" (+/-) buttons)	off	off	blink on/off time: 250ms

Table 3: LED function

4. Connection

4.1 Connecting Handset to N40 Programmer Unit

1. Release the screw (A) of the cable holder (Fig. 10)
2. Unplug the connector (B) and remove the cable from the handset. (Fig. 11)
3. Plug the connection cable (C) on the handset and the PU (CON 1) (Fig.12 & 13).
4. Connect to Voltmeter or Oscilloscope (Fig. 14 or 15)

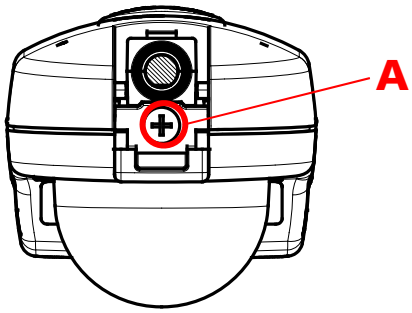


Figure 10: Handset Back / Solve Screw

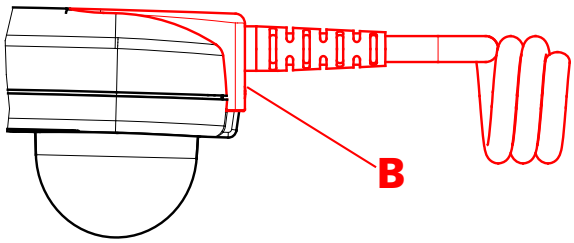


Figure 11: Handset Side / Unplug Connector

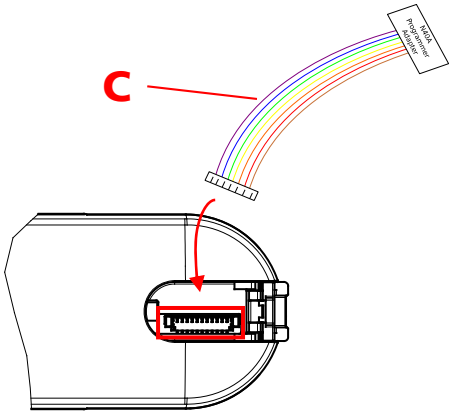


Figure 12: Handset Top / Plug-In Handset

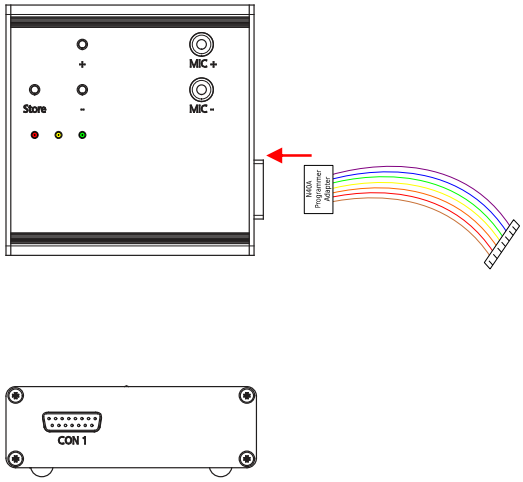


Figure 13: PU Top, Side / Plug-In PA

4.2 Setup with Artificial Mouth

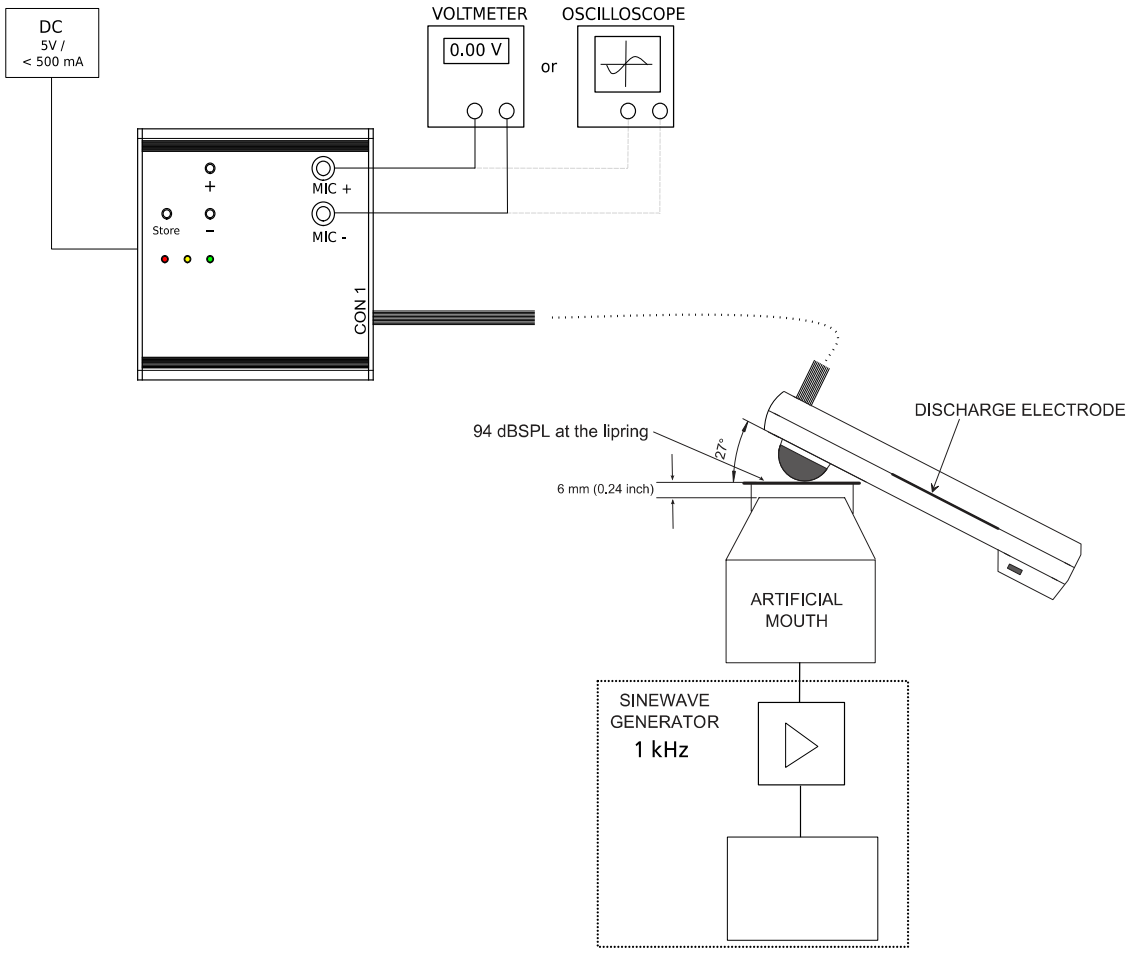


Figure 14: Setup with artificial mouth

NOTE: An Artificial Mouth can be purchased from Holmco with PNR 98-04-09393. Please contact us.

4.3 Setup with Aircraft Acoustic Tester

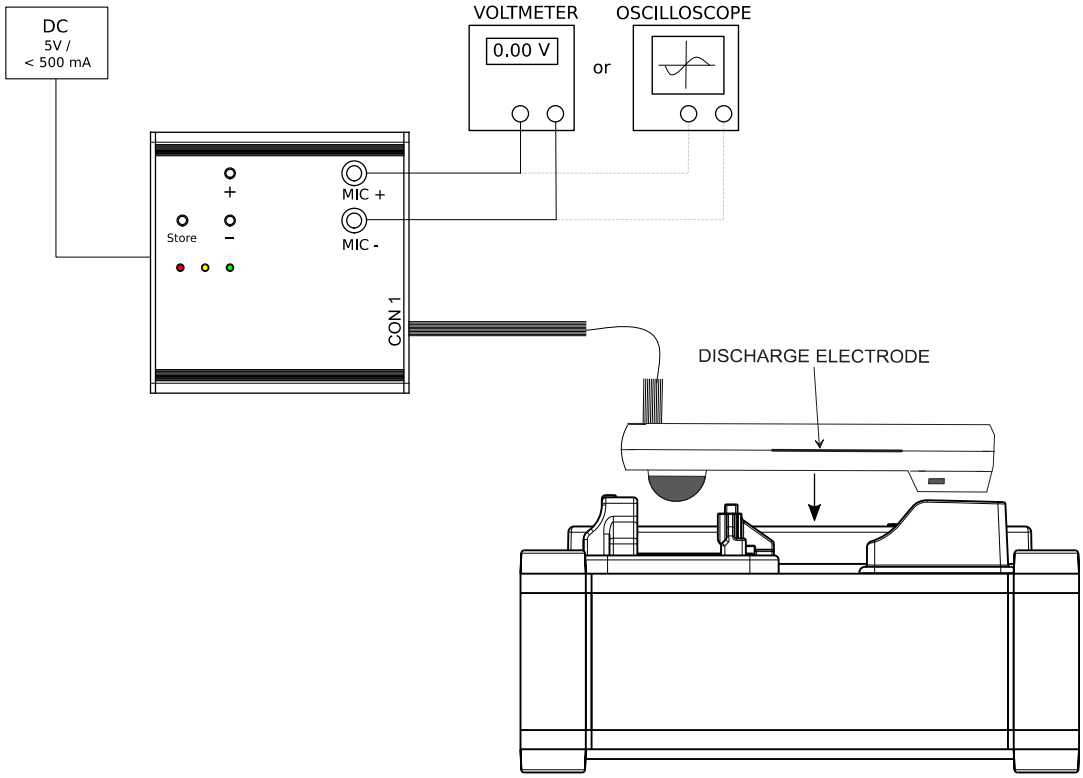


Figure 15: Setup with Aircraft Acoustic Tester

NOTE: An Aircraft Acoustic Tester can be purchased from Holmco with PNR: 98-04-12348. Please contact us.

5. Procedure

5.1 Equipment

TYPE	QTY	DESCRIPTION
Multimeter	1	VDC > 30 V ± (0.4% +1 digit) ADC > 100 mA ± (1.5% + 2 digit)
or		
Oscilloscope	1	Frequency: DC to 30 MHz Input Impedance: 1 MOhm // 20 pF Rise time: ≤ 12 ns
Sinewave Generator (*)	1	Frequency range: 30 Hz to 20 kHz Output voltage: 0.5 to 5 Volt RMS Distortion: ≤ 1% SN ratio: >60dB Output power: > 4 Watt into 4 Ohm
Loudspeaker (*)	1	Power capacity: 5 W Impedance: 4 Ohm, Distortion (at 1 kHz, 3 W, 6 mm): < 3 %
Sound Level Meter (*)	1	Measuring range: 58 to 135 dB (lin.) SNR: < 5 dB
with		
Microphone (*)	1	Frequency response: 4 to 16 kHz ± 2 dB Sensitivity: approx. 14 mV / Pa

Table 4: Equipment

Note: (*) Equipment is not necessary by using an Aircraft Acoustic Tester

5.2 Procedure with Artificial Mouth

i. Connect the handset as described in chapter 6.

ii. Connect the sine wave generator to the artificial mouth.

iii. Set the sine wave frequency to 1.0 kHz. Use the Precision Sound Level Meter to adjust the sound pressure level (SPL) to 94 dB in a distance of 6 mm to artificial mouth.

iv. Power up the N40 Programmer Unit by connecting an USB cable or a power supply.

v. RED LED switches on and off and GREEN LED switches on. The green LED lights continuously.

vi. Put the handset in an angle of approx. 27° and a distance of 6 mm to the artificial mouth. (See figure 14)

vii. Stimulate the microphone with 94 dB SPL at 1 kHz with the artificial mouth. (See figure 14)

viii. Read out handset output voltage on voltmeter or on oscilloscope. According to CMM 44-10-03 the handset output voltage must be 63 mV_{RMS} ± 10%.

ix. If the microphone level is not correct, adjust it on N40 Programmer Unit with plus button (fig. 5, item 1) or minus button (fig. 5, item 2) to its correct level. The handset switches in service mode and the green LED starts flashing.

x. If the specified microphone level has been reached, press the store button to finish the adjustment. The handset switches in operation mode.

xi. Green LED lights continuously.

CAUTION: IF ADJUSTMENT IS DONE, SET HANDSET BACK IN OPERATION MODE (STORE BUTTON). OTHERWISE THE DEVICE IS NOT WORKING FOR USUAL OPERATION.

5.3 Procedure with Aircraft Acoustic Tester

i. Connect the handset as described in chapter 6.

ii. Switch on the Aircraft Acoustic Tester.

iii. Power up the PU by connecting USB cable or power supply.

iv. RED LED switches off and the GREEN LED switches on. The green LED lights continuously.

v. Put the handset onto the Aircraft Acoustic Tester. (See figure 15)

vi. At AAT, press center soft key button TONE to select the audio output signal to SINUS 1 kHz.

- The display of AAT shows

SPK: SINUS 1k		
VOL: 94 dBSPL		
-	SWEEP	+

NOTE: You can also select the audio output signal to SWEEP, NOISE, or EXTERN, but for this test the audio output signal has to be selected to SINUS 1 kHz, VOL: 94 dB SPL.

vii. Read out handset output voltage on voltmeter or on oscilloscope. According to CMM 44-10-03 the handset output voltage must be 63 mV_{RMS} ± 10%.

viii. If the microphone level is not correct, adjust it on N40 Programmer Unit with plus button (fig. 5, item 1) or minus button (fig. 5, item 2) to its correct level. The handset switches in service mode and the green LED starts flashing.

ix. If the specified microphone level has been reached, press the store button to finish the adjustment. The handset switches in operation mode.

x. Green LED lights continuously.

CAUTION: IF ADJUSTMENT IS DONE, SET HANDSET BACK IN OPERATION MODE (STORE BUTTON). OTHERWISE THE DEVICE IS NOT WORKING FOR USUAL OPERATION.

6. Technical Data

Power Supply
5V DC or Micro USB

External connection
CON1 ..... 15 PIN D-SUB socket
USB ..... Micro USB socket
MIC+ / MIC - ..... Banana Jack 4mm
LAN ..... LAN socket

Temperature Range
Operation ..... +10 °C to + 40 °C
Storage ..... 0 °C to + 70 °C

Dimensions and Weight
length x width x height ..... (104 x 105 x 34) mm
weight ..... 0.276 kg

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