



Macrotel X Multimode

(Rev. 4.5)

SUMMARY

SUMMARY	2
SAFETY WARNINGS / ISTRUZIONI PER LA SICUREZZA	3
PREFACE	4
SAFETY WARNINGS	5
CONSIGNES DE SÉCURITÉ IMPORTANTES	7
ISTRUZIONI IMPORTANTI PER LA SICUREZZA	9
WICHTIGE SICHERHEITSHINWEISE	11
INSTRUCCIONES IMPORTANTES DE SEGURIDAD	13
UNPACKING AND INSPECTION	15
FIRST INSTALLATION RECOMMENDATIONS	16
POWER SUPPLY CABLE	16
PROTECTION AGAINST LIGHTNING	16
VENTILATION	17
DEVICE INSTALLATION	17
DEVICE GENERAL DESCRIPTION	19
DIMENSIONS AND SIZE	19
FRONT PANEL	20
REAR PANEL	21
1 FIRST DEVICE START	22
1.1 MACROTEL CONNECTION PROCEDURE	24
HYBRID TELEPHONE THEORY	24
THE TELCO, MIX-MINUS AND N-1 CONCEPT	24
1.2 STARTING YOUR QUICK SETUP	25
1.3 CONNECTIONS	26

2 HOME PAGE	28
2.1 INFORMATION ZONE	29
2.2 MODE	30
A – MODE SELECTION	30
B – MODE CONDITION	30
C - MODE OPERATIONS	32
2.3 CONFIGURATIONS ZONE	34
2.3.1 PHONE SETTINGS	35
2.3.2 VOIP SETTINGS	36
2.3.3 BT CALL SETTINGS	37
2.3.4 BT STREAM SETTINGS	37
2.3.5 GENERAL SETTINGS	38
3 WEEE DIRECTIVE – INFORMATIVA RAEE	42
4 WARRANTY	43
DECLARATION OF CONFORMITY – MACROTEL X1 MULTIMODE	44
DICHIARAZIONE DI CONFORMITÀ' - MACROTEL X1 MULTIMODE	45
DECLARATION OF CONFORMITY – MACROTEL X2 MULTIMODE	46
DICHIARAZIONE DI CONFORMITÀ' - MACROTEL X2 MULTIMODE	47

SAFETY WARNINGS / ISTRUZIONI PER LA SICUREZZA

SAFETY WARNINGS

CONSIGNES DE SÉCURITÉ IMPORTANTES

ISTRUZIONI IMPORTANTI PER LA SICUREZZA

WICHTIGE SICHERHEITSHINWEISE

INSTRUCCIONES IMPORTANTES DE SEGURIDAD

(Rel. 1.6)

PREFACE

**For your own safety and to avoid invalidation of the warranty all text marked with these Warning Symbols should be read carefully.
all the texts marked with the Warning Symbols.**



Information in this manual is subject to change without notice and does not represent a commitment on the part of the vendor. The manufacturer shall not be liable for any loss or damage whatsoever arising from the use of information or any error contained in this manual, or through any mis-operation or fault in hardware contained in the product.

It is recommended that all maintenance and service on the product should be carried out by the manufacturer or its authorized agents. The manufacturer cannot accept any liability whatsoever for any loss or damage caused by service, maintenance or repair by unauthorized personnel

SAFETY WARNINGS

The installation and servicing instructions in this manual are for use by qualified personnel only.

Read All Instructions. All safety and operating instructions must be read before operating the product. They also must be retained for future reference, as it contains a number of useful hints for determining the best combination of equipment settings for Your particular application.

Heed All Warnings. All warnings on the product and those listed in the operating instructions must be adhered to.

Heat. This product must be situated away from any heat sources such as radiators or other products (including power amplifiers or transmitters) that produce heat.

Power Sources. This product must be operated from the type of power source indicated on the marking label and in the installation instructions. If you are not sure of the type of power supplied to your facility, consult your local power company. Make sure the AC main voltage corresponds to that indicated in the technical specifications. If a different voltage (ex. 110/115 VAC) is available, open the equipment closure and set the voltage switch on the main supply circuit, located behind the AC socket.

Power Cord Protection. Power supply cords must be routed so that they are not likely to be walked on or pinched by items placed upon or against them. Pay particular attention to the cords at AC wall plugs and convenience receptacles, and at the point where the cord plugs into the product.

Use only with a cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.

Lightning. For added protection for this product during a lightning storm, or when it is left unattended and unused for long periods of time, unplug it from the AC wall outlet and the audio connections. This will prevent damage to the product due to lightning and power line surges.

Installation. Configuration and installation should only be carried out by a competent installation engineer.

Cabling. Using high-quality wires, well protected. Make sure the cable integrity.



This symbol alerts you to the presence of dangerous voltage inside the closure – voltage which may be sufficient to constitute a risk of shock. Do not perform any servicing other than that contained in the operating instructions. Refer all servicing to qualified personnel.



The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.



Do not change the voltage setting or replace the mains fuse without first turning the unit off and unplugging the mains cord.



Make sure the AC main voltage corresponds to that indicated in the technical specifications.

THIS APPARATUS MUST BE EARTHED!



To avoid the risk of fire use the correct value fuse, as indicated on the label stuck on the right side of the unit.



This apparatus uses a single pole mains switch and does therefore not separate the unit completely from the mains power. To completely separate from mains power (f.i. in the event of danger) unplug mains power cord. As the MAINS plug is the disconnect device, the disconnect device shall remain readily operable.

CONSIGNES DE SÉCURITÉ IMPORTANTES

Lire ces consignes.

Conserver ces consignes.

Observer tous les avertissements.

Suivre toutes les consignes.

Ne pas utiliser cet appareil à proximité de l'eau.

Ne pas obstruer les ouvertures de ventilation. Installer en respectant les consignes du fabricant.

Ne pas installer à proximité d'une source de chaleur telle qu'un radiateur, une bouche de chaleur, un poêle ou d'autres appareils (dont les amplificateurs) produisant de la chaleur.

Ne pas annuler la sécurité de la fiche de terre, la troisième branche est destinée à la sécurité. Si la fiche fournie ne s'adapte pas à la prise électrique, demander à un électricien de remplacer la prise hors normes.

Protéger le cordon d'alimentation afin que personne ne marche dessus et que rien ne le pince, en particulier aux fiches, aux prises de courant et au point de sortie de l'appareil.

Utiliser uniquement les accessoires spécifiés par le fabricant.

Utiliser uniquement avec un chariot, un support ou une table spécifié par le fabricant ou vendu avec l'appareil. Si un chariot est utilisé, déplacer l'ensemble chariot–appareil avec précaution afin de ne pas le renverser, ce qui pourrait entraîner des blessures.

Débrancher l'appareil pendant les orages ou quand il ne sera pas utilisé pendant longtemps.

Confier toute réparation à du personnel qualifié. Des réparations sont nécessaires si l'appareil est endommagé d'une façon quelconque, par exemple: cordon ou prise d'alimentation endommagé, liquide renversé ou objet tombé à l'intérieur de l'appareil, exposition de l'appareil à la pluie ou à l'humidité, appareil qui ne marche pas normalement ou que l'on a fait tomber.

NE PAS exposer cet appareil aux égouttures et aux éclaboussures. Ne pas poser des objets contenant de l'eau, comme des vases, sur l'appareil.



Ce symbole indique la présence d'une tension dangereuse dans l'appareil constituant un risque de choc électrique.



Ce symbole indique que la documentation fournie avec l'appareil contient des instructions d'utilisation et d'entretien importantes.



Avant de modifier le commutateur de changement de tension ou remplacer le fusible il faut débrancher l'appareil de la prise électrique. Pendant son usage, l'appareil doit être branché à la prise de terre.



Utiliser le fusible principal AC avec la valeur qui est indiquée sur l'étiquette collée sur le coffret.



Assurez-vous que la tension principale AC correspond à celle indiquée dans les spécifications techniques.



L'interrupteur d'alimentation interrompt un pôle du réseau d'alimentation excepté le conducteur de terre de protection. En cas de danger, débrancher le cordon d'alimentation. Parce que la prise du réseau de alimentation est utilisée comme dispositif de déconnexion, ce dispositif doit demeurer aisément accessible.

ISTRUZIONI IMPORTANTI PER LA SICUREZZA

Leggere le presenti istruzioni.

Conservare queste istruzioni.

Osservare tutte le avvertenze.

Seguire scrupolosamente tutte le istruzioni.

Non usare questo apparecchio in prossimità di acqua.

Non ostruire alcuna apertura per il raffreddamento. Installare l'apparecchio seguendo le istruzioni.

Non installare l'apparecchio accanto a fonti di calore quali radiatori, aperture per l'afflusso di aria calda, forni o altri apparecchi (amplificatori inclusi) che generino calore.

Non rimuovere il terminale di connessione a terra sul cordone di alimentazione: esso ha lo scopo di tutelare l'incolumità dell'utilizzatore. Se la spina in dotazione non si adatta alla presa di corrente, rivolgersi ad un elettricista per far eseguire le modifiche necessarie.

Evitare di calpestare il cavo di alimentazione o di comprimerlo, specialmente in corrispondenza della spina e del punto di inserzione sull'apparato.

Utilizzare solo dispositivi di collegamento e gli accessori specificati dal produttore.

Utilizzare l'apparecchio solo con un carrello, un sostegno, una staffa o un tavolo di tipo specificato dal produttore o venduto insieme all'apparecchio. Se si utilizza un carrello, fare attenzione negli spostamenti per evitare infortuni causati da ribaltamenti del carrello stesso.

Scollegare l'apparecchio dalla presa di corrente durante i temporali o quando inutilizzato a lungo.

Per qualsiasi intervento, rivolgersi a personale di assistenza qualificato. È necessario intervenire sull'apparecchio ogniqualvolta si verificano danneggiamenti di qualsiasi natura. Ad esempio, la spina o il cavo di alimentazione sono danneggiati, è entrato liquido nell'apparecchio o sono caduti oggetti su di esso, l'apparecchio è stato esposto alla pioggia o all'umidità, non funziona normalmente o è caduto.

Non esporre a sgocciolamenti o spruzzi. Non appoggiare sull'apparecchio oggetti pieni di liquidi, ad esempio vasi da fiori.



Questo simbolo indica la presenza di alta tensione all'interno dell'apparecchio, che comporta rischi di scossa elettrica.



Questo simbolo indica la presenza di istruzioni importanti per l'uso e la manutenzione nella documentazione in dotazione all'apparecchio.



Non sostituire il fusibile o cambiare la tensione di alimentazione senza aver prima scollegato il cordone di alimentazione. **L'APPARATO DEVE ESSERE CONNESSO A TERRA.**



Sostituire il fusibile generale con uno di identico valore, come indicato sulla etichetta applicata sul mobile dell'apparato



Assicurarsi che la tensione di rete corrisponda a quella per la quale è configurato l'apparecchio.



Questo apparato utilizza un interruttore di alimentazione di tipo unipolare e l'isolamento dalla rete elettrica non è pertanto completo. Per ottenere un isolamento totale (ad esempio in caso di pericolo), scollegare il cordone di alimentazione. Inoltre, poichè la spina di alimentazione è utilizzata come dispositivo di sezionamento, essa deve restare facilmente raggiungibile.

WICHTIGE SICHERHEITSHINWEISE

Diese Hinweise LESEN.

Diese Hinweise AUFHEBEN.

Alle Warnhinweise BEACHTEN.

Alle Anweisungen BEFOLGEN.

Dieses Gerät NICHT in der Nähe von Wasser verwenden.

KEINE Lüftungsöffnungen verdecken. Gemäß den Anweisungen des Herstellers einbauen.

Nicht in der Nähe von Wärmequellen, wie Heizkörpern, Raumheizungen, Herden oder anderen Geräten (einschließlich Verstärkern) installieren, die Wärme erzeugen.

Die Schutzfunktion des Schukosteckers NICHT umgehen. Bei Steckern für die USA gibt es polarisierte Stecker, bei denen ein Leiter breiter als der andere ist; US-Stecker mit Erdung verfügen über einen dritten Schutzleiter. Bei diesen Steckerausführungen dient der breitere Leiter bzw. der Schutzleiter Ihrer Sicherheit. Wenn der mitgelieferte Stecker nicht in die Steckdose passt, einen Elektriker mit dem Austauschen der veralteten Steckdose beauftragen.

VERHINDERN, dass das Netzkabel gequetscht oder darauf getreten wird, insbesondere im Bereich der Stecker, Netzsteckdosen und an der Austrittsstelle vom Gerät.

NUR das vom Hersteller angegebene Zubehör und entsprechende Zusatzgeräte verwenden.

NUR in Verbindung mit einem vom Hersteller angegebenen oder mit dem Gerät verkauften Transportwagen, Stand, Stativ, Träger oder Tisch verwenden. Wenn ein Transportwagen verwendet wird, beim Verschieben der Transportwagen-Geräte- Einheit vorsichtig vorgehen, um Verletzungen durch Umkippen.

Das Netzkabel dieses Geräts während Gewittern oder bei längeren Stillstandszeiten aus der Steckdose ABZIEHEN.

Alle Reparatur- und Wartungsarbeiten von qualifiziertem Kundendienstpersonal DURCHFÜHREN LASSEN. Kundendienst ist erforderlich, wenn das Gerät auf irgendeine Weise beschädigt wurde, z.B. wenn das Netzkabel oder der Netzstecker beschädigt wurden, wenn Flüssigkeiten in das Gerät verschüttet wurden oder Fremdkörper hineinfielen, wenn das Gerät Regen oder Feuchtigkeit ausgesetzt war, nicht normal funktioniert oder fallen gelassen wurde.

Dieses Gerät vor Tropf- und Spritzwasser SCHÜTZEN. KEINE mit Wasser gefüllten Gegenstände wie zum Beispiel Vasen auf das Gerät STELLEN.



Dieses Symbol zeigt an, dass gefährliche Spannungswerte, die ein Stromschlagrisiko darstellen, innerhalb dieses Geräts auftreten.



Dieses Symbol zeigt an, dass das diesem Gerät beiliegende Handbuch wichtige Betriebs- und Wartungsanweisungen enthält.



Vor Änderung der Netzspannung oder Sicherungswechsel Netzkabel trennen.
Das Gerät muss für den Betrieb geerdet werden.



Hauptsicherung nur mit einer gleichwertigen austauschen
(s. entsprechende Etikette).



Vor Einschalten Netzspannungseinstellung am Gerät überprüfen bzw. anpassen.



Inpoliger Netzschalter. In Notfälle oder für Wartungsarbeiten Netzkabel trennen. Der Netzstecker fungiert auch als Trennelement muss deshalb zugänglich bleiben.

INSTRUCCIONES IMPORTANTES DE SEGURIDAD

LEA estas instrucciones.

CONSERVE estas instrucciones.

PRESTE ATENCION a todas las advertencias.

SIGA todas las instrucciones.

NO utilice este aparato cerca del agua.

NO obstruya ninguna de las aberturas de ventilación. Instálese según lo indicado en las instrucciones del fabricante.

No instale el aparato cerca de fuentes de calor tales como radiadores, registros de calefacción, estufas u otros aparatos (incluyendo amplificadores) que produzcan calor.

NO anule la función de seguridad del enchufe polarizado o con clavija de puesta a tierra. Un enchufe polarizado tiene dos patas, una más ancha que la otra. Un enchufe con puesta a tierra tiene dos patas y una tercera clavija con puesta a tierra. La pata más ancha o la tercera clavija se proporciona para su seguridad. Si el toma corriente no es del tipo apropiado para el enchufe, consulte a un electricista para que sustituya el toma corriente de estilo anticuado.

PROTEJA el cable eléctrico para evitar que personas lo pisen o estrujen, particularmente en sus enchufes, en los toma corrientes y en el punto en el cual sale del aparato.

UTILICE únicamente los accesorios especificados por el fabricante.

UTILICESE únicamente con un carro, pedestal, escuadra o mesa del tipo especificado por el fabricante o vendido con el aparato. Si se usa un carro, el mismo debe moverse con sumo cuidado para evitar que se vuelque con el aparato.

DESENCHUFE el aparato durante las tormentas eléctricas, o si no va a ser utilizado por un lapso prolongado.

TODA reparación debe ser llevada a cabo por técnicos calificados. El aparato requiere reparación si ha sufrido cualquier tipo de daño, incluyendo los daños al cordón o enchufe eléctrico, si se derrama líquido sobre el aparato o si caen objetos en su interior, si ha sido expuesto a la lluvia o la humedad, si no funciona de modo normal, o si se ha caído.

NO exponga este aparato a chorros o salpicaduras de líquidos. NO coloque objetos llenos con líquido, tales como floreros, sobre el aparato .



Este símbolo indica que la unidad contiene niveles de voltaje peligrosos que representan un riesgo de choques eléctricos.



Este símbolo indica que la literatura que acompaña a esta unidad contiene instrucciones importantes de funcionamiento y mantenimiento.



Antes de cambiar la alimentación de voltaje o de cambiar el fusible, desconecte el cable de alimentación. Para reducir el riesgo de descargas eléctricas, esta unidad debe ser conectada a tierra.



Remplaze el fusible con lo mismo, que corresponde a lo indicado en el panel del equipo.



Antes de encender, controlar que la línea de alimentación de voltaje corresponda a la indicada.



El interruptor de alimentación es unipolar. En el caso de peligro, desconecte el cable de alimentación. Porque la clavija de conexión a red sirve por la desconexión de la unidad, la clavija debe ser ubicada en proximidad de la unidad.

UNPACKING AND INSPECTION

Your equipment was packed carefully at the factory in a container designed to protect the unit during shipment. Nevertheless, we recommend making a careful inspection of the shipping carton and the contents for any signs of physical damage.

Damage & Claims

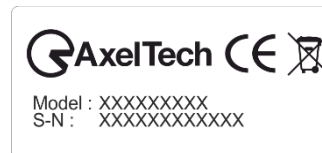
If the damage is evident, do not discard the container or packing material. Contact your carrier immediately to file a claim for damages. Customarily, the carrier requires you, the consignee, to make all damage claims. It will be helpful to retain the shipping documents and the waybill number.

Save all packing materials! If You should ever have to ship the unit (e.g. for servicing), it is best to ship it in the original carton with its packing materials because both the carton and packing material have been carefully designed to protect the unit.

Under normal conditions, no user maintenance or calibration is required. Internal links and preset controls may be set to configure the unit during installation. Any service work required should be carried out by qualified service personnel only. We are able to offer further product support through our worldwide network of approved dealers and service agents.

To help us provide the most efficient service please would you keep a record of the unit serial number and date and place of purchase to be quoted in any communication regarding this product.

The actual equipment Serial Number is indicated on the silver label stuck on the rear panel of the equipment closure.



Tools And Equipment Needed

Only standard technician's tools are required to install this equipment.

FIRST INSTALLATION RECOMMENDATIONS

POWER SUPPLY CABLE

A power supply cable of approx. 2 mt lengths is supplied with the device, which has a molded IEC plug attached – this is a legal requirement. The type of plug for the power supply depends on the country in which it is delivered.

If for any reason, you need to use this appliance with a different plug, you should use the following wiring guidelines in replacing the existing plug with the new one:

Earth	Green, or green and yellow
Neutral (N)	Blue
Live (L)	Brown

Supply cables should be laid in such a manner that one does not step or walk on them. They should not be squashed by any objects.

THIS EQUIPMENT MUST BE EARTHED.

The chassis is always connected to mains earth to ensure your safety: check your mains wiring and earthing before switching on.

PROTECTION AGAINST LIGHTNING



Should the device be put out of action due to being struck by lightning or excess voltage, disconnect it from the power supply without delay. Do not reconnect until the device has been checked. If in doubt contact the technical support service.

Make sure there is suitable lightning protection to protect the device. Alternatively, you should disconnect all connectors from the device during a storm or when the device is going to be unsupervised or not used for a longer period of time.

These measures will protect against damage by lightning or excess voltage.

VENTILATION

The equipment will operate as a free-standing unit without requiring any special cooling arrangement. However, slots and openings in the product are provided for ventilation. They ensure reliable operation of the product, keeping it from overheating. These openings must not be blocked nor covered during operation.

YOU MUST LEAVE AT A MINIMUM ONE RACK UNIT OF EMPTY SPACE ABOVE THE EQUIPMENT TO ENHANCE VENTILATION AND TO GET A LONGER EQUIPMENT LIFE.

DEVICE INSTALLATION

Best setup location

The device should be installed in a 19" rack. Avoid direct sunlight, close proximity to radiators and air conditioning, dust, water, and chemicals. Choose a rack location that permits a clear view, to the indicators on the device and ensures a sufficient heat dissipation of the device.

Power supply

The device is designed for operation with 100 to 240 V AC, 50 Hz to 60 Hz. Check the corresponding device labeling for compatibility to the domestic line voltage and frequency before connecting the IEC power connector to the mains supply!



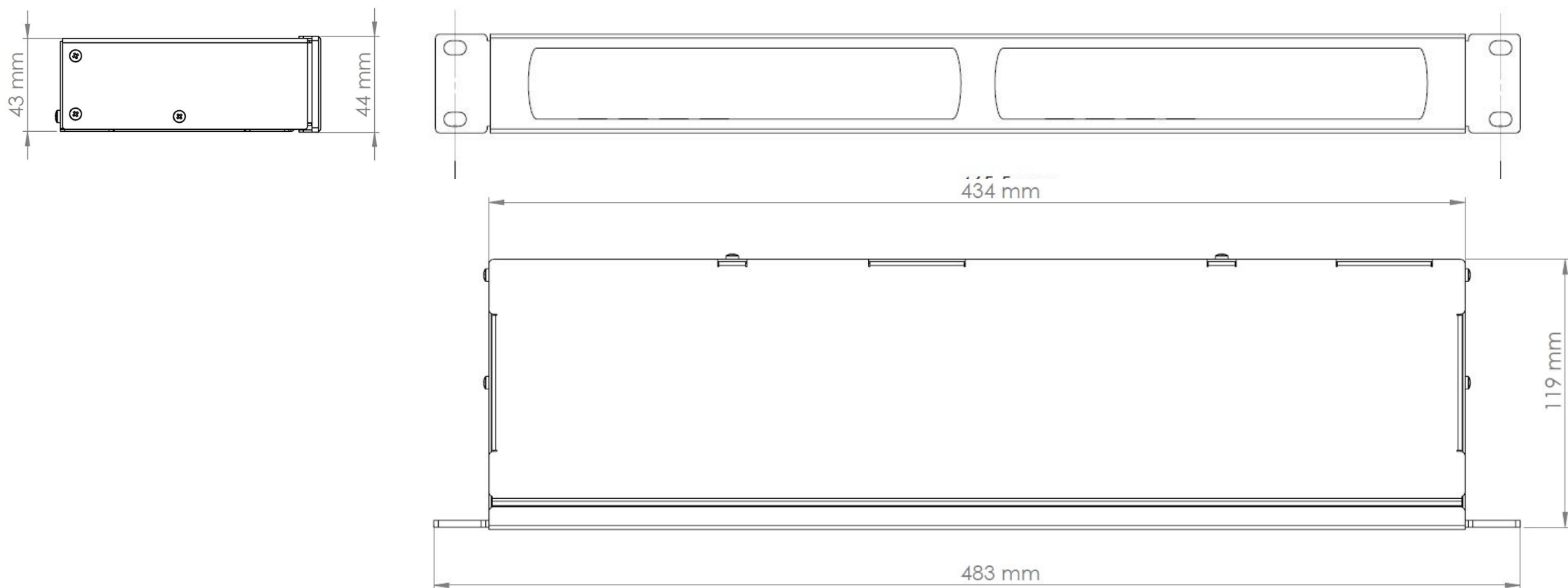
WARNING

Disconnect mains power plug before you open the housing. Repair of the equipment must only be carried out by authorized and qualified personnel.

Power Supply	Please make sure that the device and the contained fuse(s) are compatible to the domestic line voltage and frequency. If the device is compatible, connect the power supply cord fully to the IEC power connector at the rear side of the device and a mains power outlet.
Network configuration	For delivery, the device is configured with default settings for the first connection via the IP interface.
Connect to network	Connect a network patch cable to the “10/100-Base-T” connector on the rear side of the device and your existing IP network.
Web interface	The device can be fully operated with an internet browser via the integrated web interface. Use a computer that is connected to the same IP network that the device is connected to. Start an internet browser, Firefox/Mozilla >V2.0 Google Chrome both with Java Script activated and enter the configured IP address in the address bar of the browser. If the IP address has not been changed in step 2, please enter the default address in the address bar of the browser: 192.168.120.120 .
Ready!	These first steps are only intended for a quick first start and do not cover all device functions. Please read carefully the entire manual to be able to use all functions of the device.
The Username.	The equipment comes out from Axel Technology with a standard username: <i>admin</i> .

DEVICE GENERAL DESCRIPTION

DIMENSIONS AND SIZE



FRONT PANEL

Macrotel X2



- USB Port - Type A.
- RX & TX audio level LED meter.
- Mode switches POTS/BT/VOIP.
- RX & TX audio level buttons.
- Hook & Hold on buttons.
- ON/OFF status LED indicator.

REAR PANEL

Macrotel X2



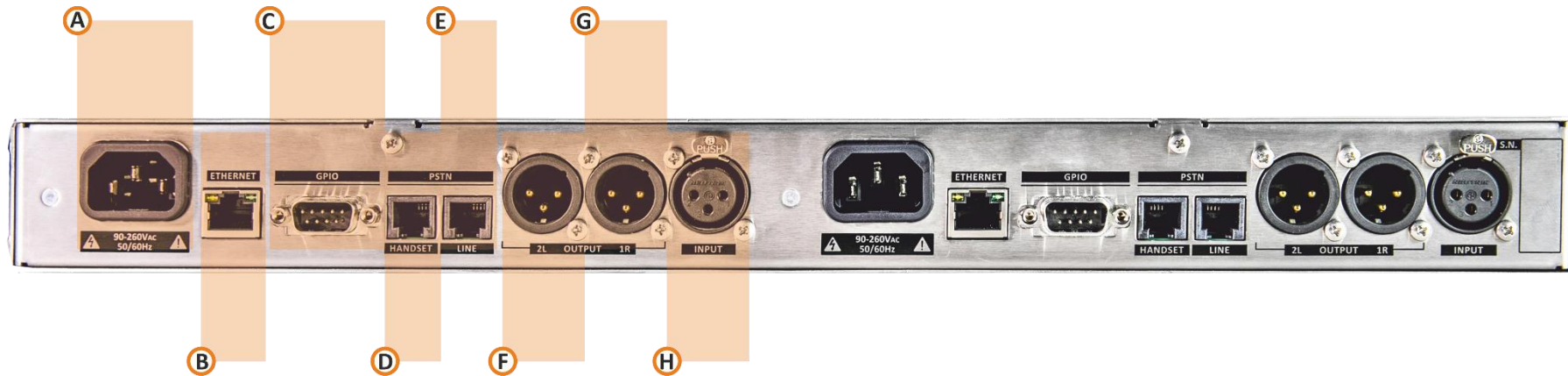
- Universal Power Supply 90Vac - 240Vac 50/60Hz.
- LAN/WAN Ethernet port.
- GPIO Port with 4 optocouplers IN, and 4 optocouplers OUT. SubD9 PIN connector.
- RJ11 OUTPUT telephone connector for the external telephone HANDSET.
- RJ11 INPUT telephone connector for the telephone LINE/GSM GATEWAY.
- 2XLR analog audio output.
- 1XLR analog audio input.

1 FIRST DEVICE START

After important setting changes, we suggest you always to reboot the device (For example: after a device upgrade, or changes on IP address).



- A. USB Port - Type A.
- B. 9 LEDs for the receive audio level -18dBu to +6dBu.
- C. 9 LEDs for the send audio level -18dBu to +6dBu.
- D. 3 LEDs MODE indicates with selecting button.
- E. 2 button RX audio level, receipt of the telephone/GSM/BT line.
- F. 2 button TX audio level, sending of the telephone/GSM/BT line.
- G. 1 Telephone line hook button.
- H. 1 Telephone line HOLD ON button.
- I. 1 LED status ON/PFF.

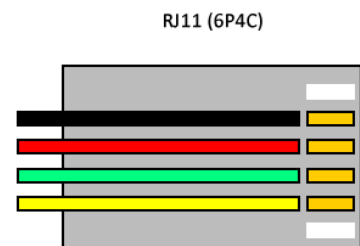


- A. Power plug:** Universal Power Supply 90Vac - 240Vac 50/60Hz.
- B. LAN:** Ethernet port over Rj45 connectors. Connect a network patch cable to the “10/100-Base-T” connector on the rear side of the device and your existing IP network.
- C. GPIO:** Port with 4 optocouplers IN, and 4 optocouplers OUT. SubD9 PIN connector. The remote interface of **MACROTEL X** is based on a 9 pin Sub-D connector and features the following functions:
 - Remote hooking of the telephone line.
 - Incoming call signal.
- D. TELEPHONE SET PORT (HANDSET):** to connect a telephone device in parallel to the hybrid (SET socket) used, for example, to dial the number to call or to answer an incoming call.
- E. TELEPHONE LINE PORT (LINE):** This unit features the RJ11 6/4 connectors to connect the PSTN/POTS telephone line to the Hybrid.
- F. ANALOG OUTPUT:** Electronically balanced analog audio output of the hybrid, on Balanced XLR connectors. (RX + TX audio).
- G. DIGITAL/ANALOG OUTPUT:** Electronically balanced audio output of the hybrid, on Balanced XLR connectors. (RX audio).
- H. DIGITAL/ANALOG INPUT:** This input is for the signal to be sent to the interlocutor via the telephone LINE/GSM, BT or VOIP.

1.1 MACROTEL CONNECTION PROCEDURE

The RJ11 connector has 4 wires, but only the two central contacts are used (usually the Red and Green wires – pin 2 and pin 3).

Pin	Colore	Description
1	black	<i>Not connected</i>
2	red	Telephone line
3	green	Telephone line
4	yellow	<i>Not connected</i>



HYBRID TELEPHONE THEORY

The telephone hybrid is a device capable of interfacing a telephone line with audio lines. In other words, the audio signals sent to the hybrid are received by phone and vice versa.

The telephone hybrid is widely used in radio and television broadcasting as it makes it possible to make simple audio connections with remote workstations at a very low cost. The signal coming from the hybrid is managed like a normal audio source.

Telephone hybrids work on the basis of the principle of separation of impedance, also filtering the power supply at 60V usually present on the telephone lines.

In the simplest form, the hybrid is conceptually an acoustic coupler, i.e., a device that acoustically takes the signals from the microphone. A telephone hybrid is actually a more complex device that can interface directly with the telephone line and make the necessary separation to avoid interference.

THE TELCO, MIX-MINUS AND N-1 CONCEPT

A fundamental part of the use of a telephone hybrid is the knowledge and proper use of the TELCO system, also called CF Clean Feed, or N-1 and/or Mix Minus. All of these terms identify the following situations:

The expression n-1 indicates, in professional audio, the audio return signal that is sent from the studio to one or more remote sources, such as a telephone hybrid. This signal is often called audio return, RX or also mix-minus in English.

1.2 STARTING YOUR QUICK SETUP

Turn **ON** the device by plug it to the power source from the rear panel:

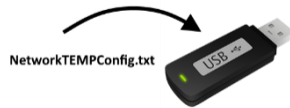
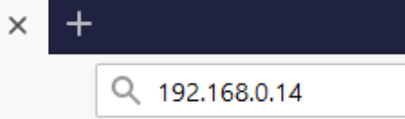
Connect the device to your **LAN network** with an ETHERNET CABLE **RJ45**. Your device could be controlled by one of the following methods:

1. The device could be controlled by a web page on your browser. In the address field of your browser, type the default IP address:

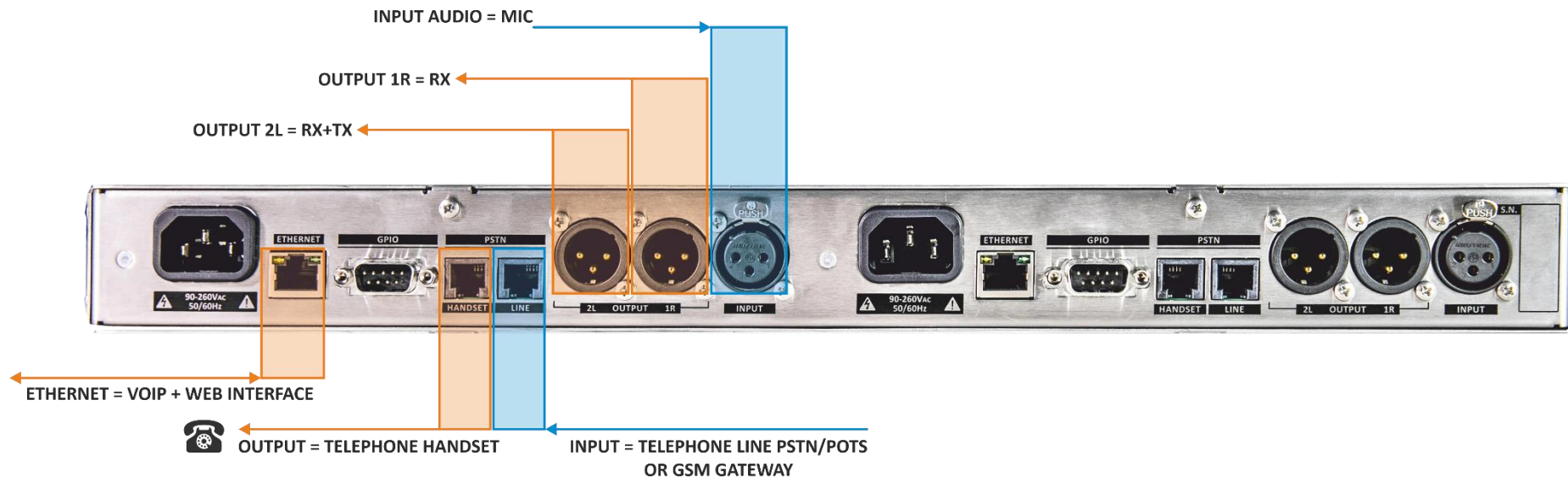
(192.168.120.120). And use your **PASSWORD** 'admin' to access to the Home Page:

In case forgetting the IP address, follow this procedure.

DEVICE TEMPORARY IP ASSIGNMENT

Take a standard USB key	
Inside the USB key create a new .txt file. The file name must be exactly: NetworkTEMPConfig.txt	
Edit NetworkTEMPConfig.txt and write inside the temporary IP you want to set for your device. The syntax has to be: IP/24	Example: 192.168.0.14/24
Insert the USB key in the USB Port of the device front panel	
Open your browser and insert the IP in the URL address. If you plug out the IP you lose the temporary IP. (in this example we have set the 192.168.0.14 IP, but you can decide freely)	

1.3 CONNECTIONS



INPUT AUDIO: Input of telephone Hybrid, with an electronically balanced XLR connection. This input is for the signal to be sent to the interlocutor via the telephone line. The signal must be of the Mix-Minus type. This input can be digital or analog as programmed.

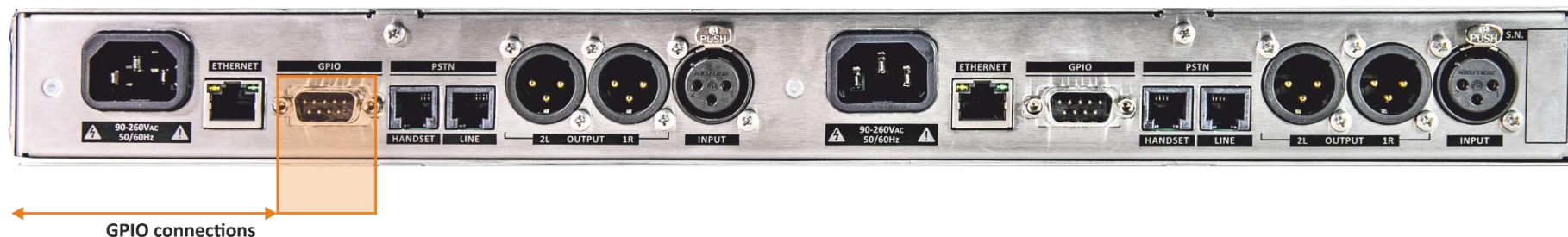
OUTPUT 1: Electronically balanced audio output of the hybrid in digital/analog signal, on Balanced XLR connector, Monotype. From this connector you can get RX in digital or analog audio signal as programmed.

OUTPUT 2: Electronically balanced audio output of the hybrid in digital/analog signal, on Balanced XLR connector, Monotype. From this connector you can get an analog RX+TX audio signal. Even if settings are changed to digital, this source still running out analog audio signal.

HANDSET: RJ11 6/4 connector to connect a telephone device in parallel to the hybrid (SET) used, for example, to dial the number to call or to answer an incoming call.

LINE: RJ11 6/4 connector to connect the **PSTN/POTS** telephone line or to connect audio interface with an external **GSM device**.

ETHERNET: to connect the device to the network for **VOIP** service and the **web interface**. is fitted with an Rj45 Ethernet port to monitor and control the device. This port can also be used to VOIP connection.



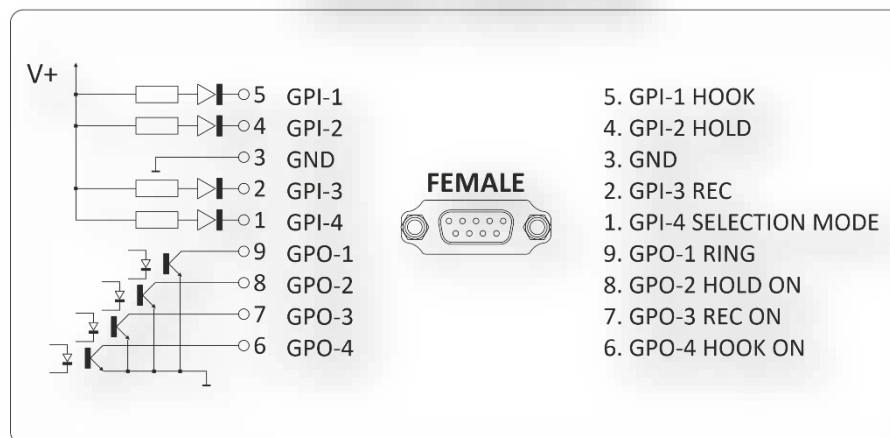
GPIO: SUB-D 9p connector - 4 GPI + 4 GPO.

A general-purpose input/output (**GPIO**) is an uncommitted digital signal pin on an integrated circuit or electronic circuit board whose behaviour—including whether it acts as input or output—is controllable by the user at run time.

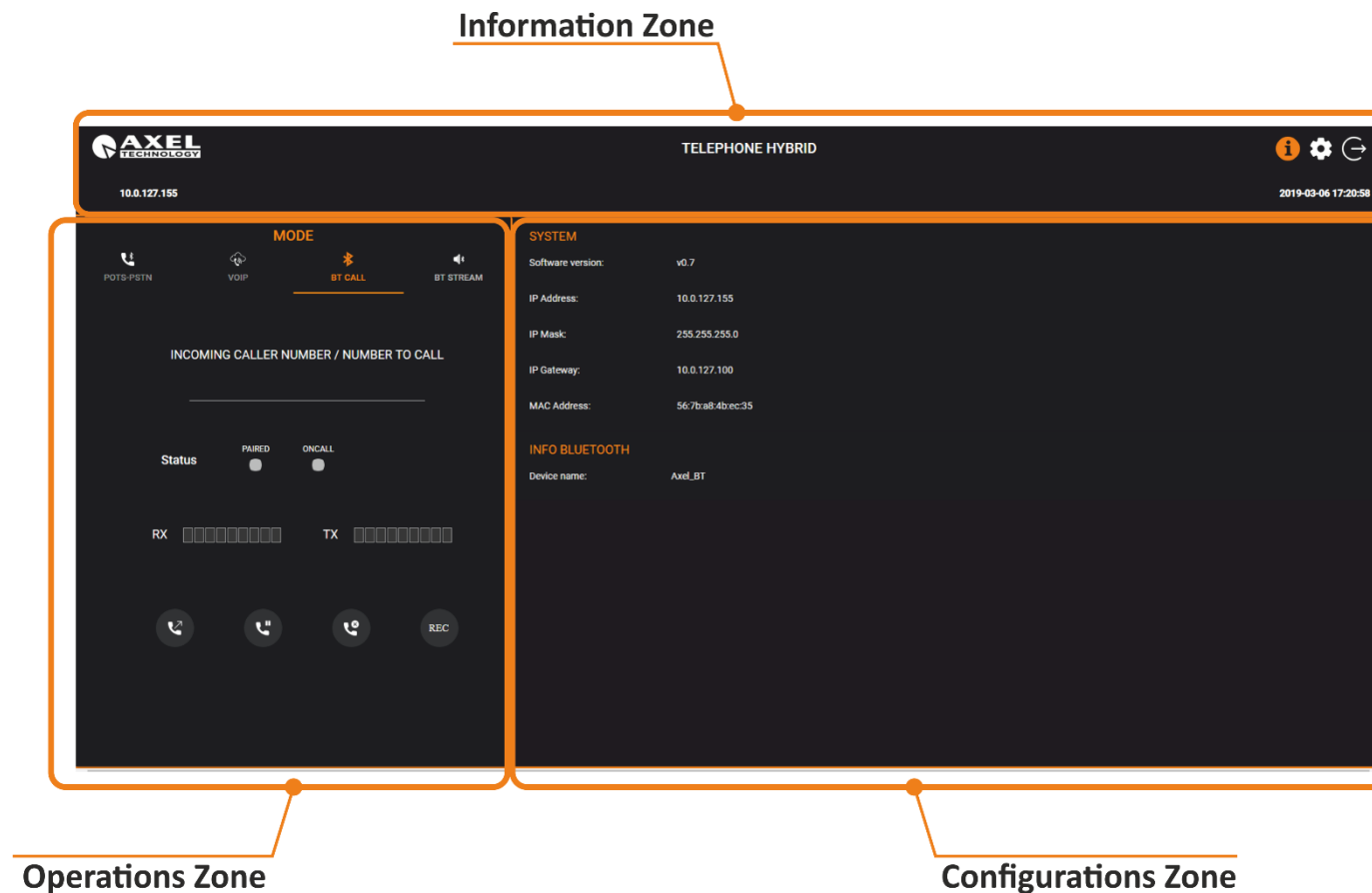
MALE CONNECTOR



FEMALE CONNECTOR



2 HOME PAGE

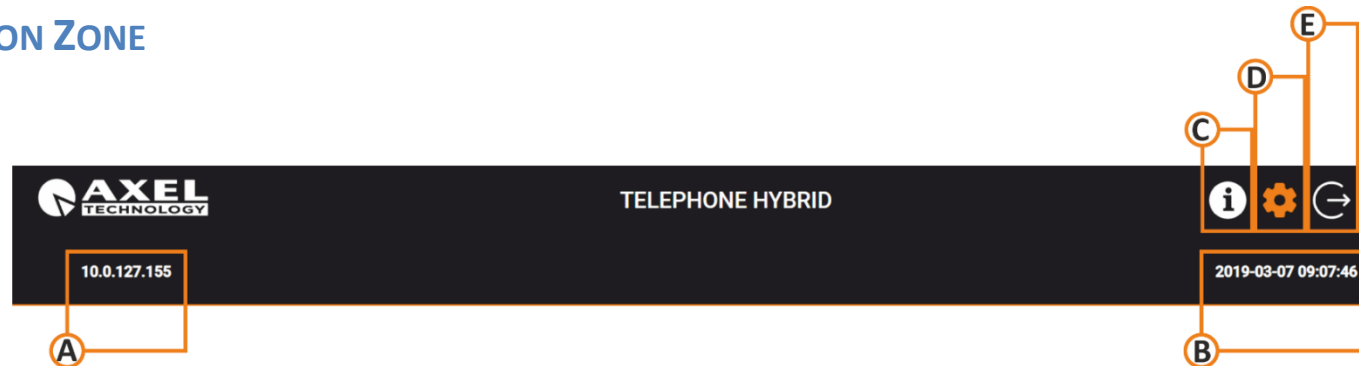


Information zone: can find in this part of web interface the IP address, Info icon, settings icon, date, time and Log out icon.

Operations zone: from this part can select the MODE (POTS-PSTN, VOIP, BT CALL, BT STREAM).

Configurations zone: by clicking on the settings icon will appear SETTINGS, AUDIO, EQUALIZER, and LOGS.

2.1 INFORMATION ZONE



- A. IP Address:** Appear the device IP address. That can be changed from [SETTINGS ICON -> GENERAL -> NETWORK SETTINGS](#).
- B. Data & Time:** Here you can view Date and Time that getting the information from **NTP** Server automatically. The settings related to the Network Time Protocol allow to change the time zone from [SETTINGS ICON -> GENERAL -> TIMEZONE SETTINGS](#).
It's programmed to connect to three NTP servers (google NTP server). In case there are problems on the first server, the device goes to the second and so on up to the third.
NOTE: *This option needs an internet connection and if that is no **GATEWAY** set it in that is cannot synchronize the device.*
Network Time Protocol. This section contains all the settings related to **NTP** features. it is, in fact, possible to connect the device to an **NTP** server and in this way the device will synchronize its own date and time with the server.
- C. Info:** by clicking on this icon will appear **SYSTEM** information (Software version, IP Address, IP Mask, IP Gateway, and MAC Address) and **INFO BT**.
- D. SETTINGS:** click here to go to all settings distributed in order in a consistent manner on multiple pages depending on the MODE with many other necessary options in that are adjustable and easy to access (PHONE, VOIP, BT CALL, BT STREAM, and GENERAL).
- E. LOGOUT:** from this icon cab logging out from the user interface and that is necessary insert the PASSWORD login again and to be able using the device.

2.2 MODE

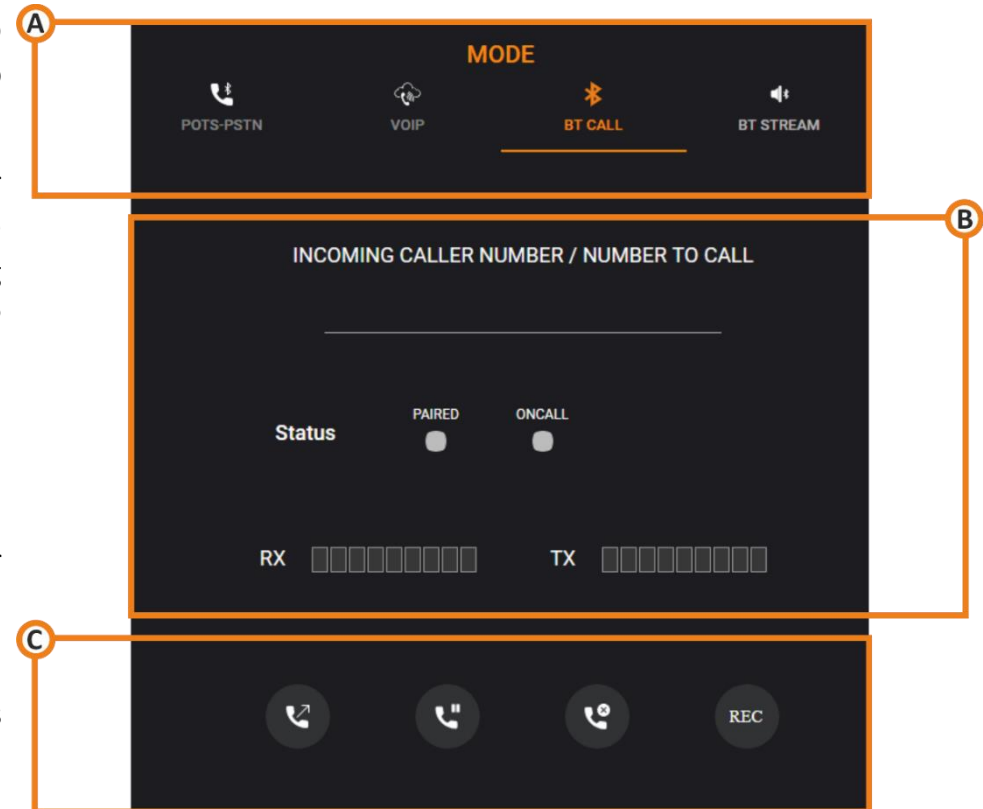
A – MODE SELECTION

POTS-PSTN: by clicking on this icon, you select the POTS-PSTN as an operations mode. This mode includes classical analog telephone lines or mobile network lines via the GSM gateway. It is able to resieve call out and also recording phone calls. For the setting go to [Settings icon -> PHONE -> \(SETTING, AUDIO, EQUALIZER\)](#).

VOIP: from here you can manage VoIP calls. We add tis mode to gave our clients more comfort and to ensure on-air and recorded phone calls sound as good as possible. Allows for caller ID, outgoing calls, screening, and post-air management using companion VoIP phone set. For the setting go to [Settings icon -> VOIP -> \(SETTING, AUDIO, EQUALIZER\)](#).

BT CALL: we devuseing this mode allow to connect any smartphone via BT to receive and make calls and record it in high quality. **MACROTEL X** it is the first hybrid with BT connection. For the setting go to [Settings icon -> BT CALL -> \(SETTING, AUDIO, EQUALIZER\)](#).

BT STREAM: dhere we create the possibilty to connect any BT device as audio input source (smartphones or audio players).



It's quite easy and semple to connect to BT just make a serch by the BT of the smartphone, and when you finde the name of the device, just click on connect. (that is no any password to sync).

B – MODE CONDITION

ID: When dial in number it's will appear in this section, also caller ID. All this data In/Out call numbers are saved in LOGS list and that is able to save it in .txt file or clear the LOGES list.

Status: here show up the the MODE status like detecting the LINE, RINGING, HOOK, HOLD.

LINE: it will appear in green when the line is connected and detected.

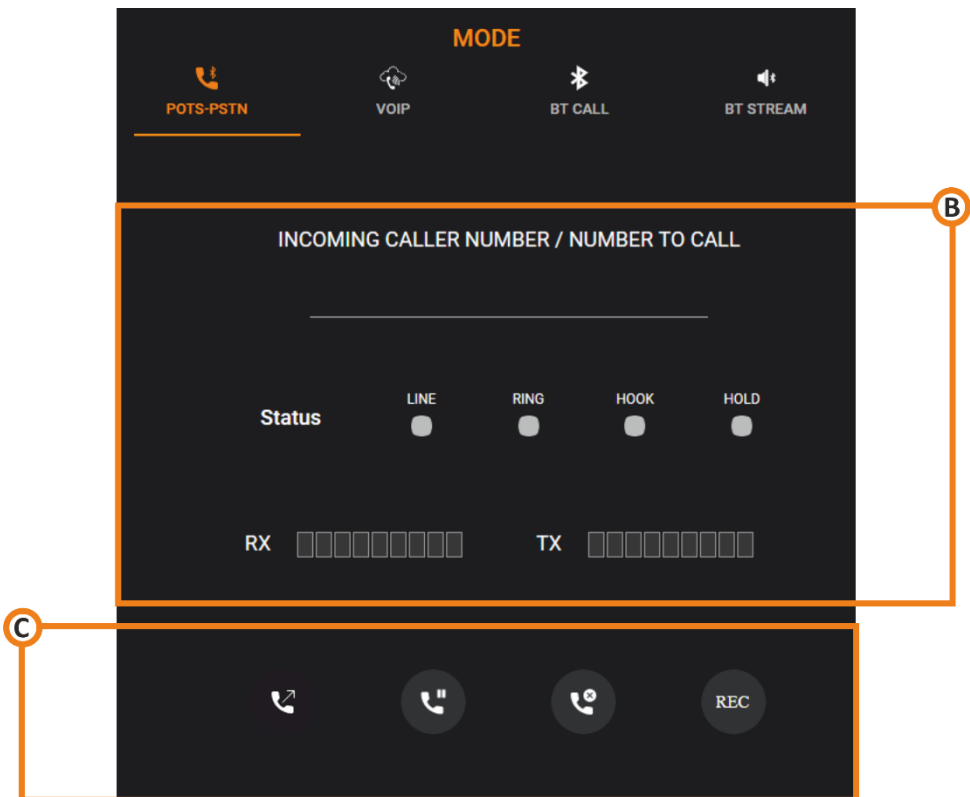
RING: this will be active "green highlight" when the call is incoming until the call is answered.

HOCK: It's will appear in active condition "green highlight" during the call. In this case that is not able to switching to another **MODE** (VOIP, BT CALL, and BT STREAM) until the call is cutted off. That I two way to hock up the call "ansure the phone call" by the hock button on the front panel or from the th icon at the web interface.

HOLD: this is to indicate that is a call in the hold. You can put the call in HOLD by pressing the HOLD button on the front panel of the device, or by clicking on the PUSE icon on the GUI *graphical user interface* (web interface).

REG (REGISTERED): it is a specific condition of the VOIP connection. When the device is connected with VOIP server then it is will appear in green highlight to indicate that.

AUTO ANSWER: that is to inform that is the automaticly answer the incoming calls. It is can ENABLE/DISABLE this



function for the web interface by going to [Settings icon -> VOIP -> SETTINGS -> OPTIONS -> Auto answer](#).

PAIRED: each time smartphone to the device, it will turn green highlight. To connect to BT just make a serch by the BT of the smartphone, and when you finde the name of the device, just click on connect. To change the name of BT go to [Settings icon -> BT CALL -> SETTINGS -> Status -> Device Name](#).

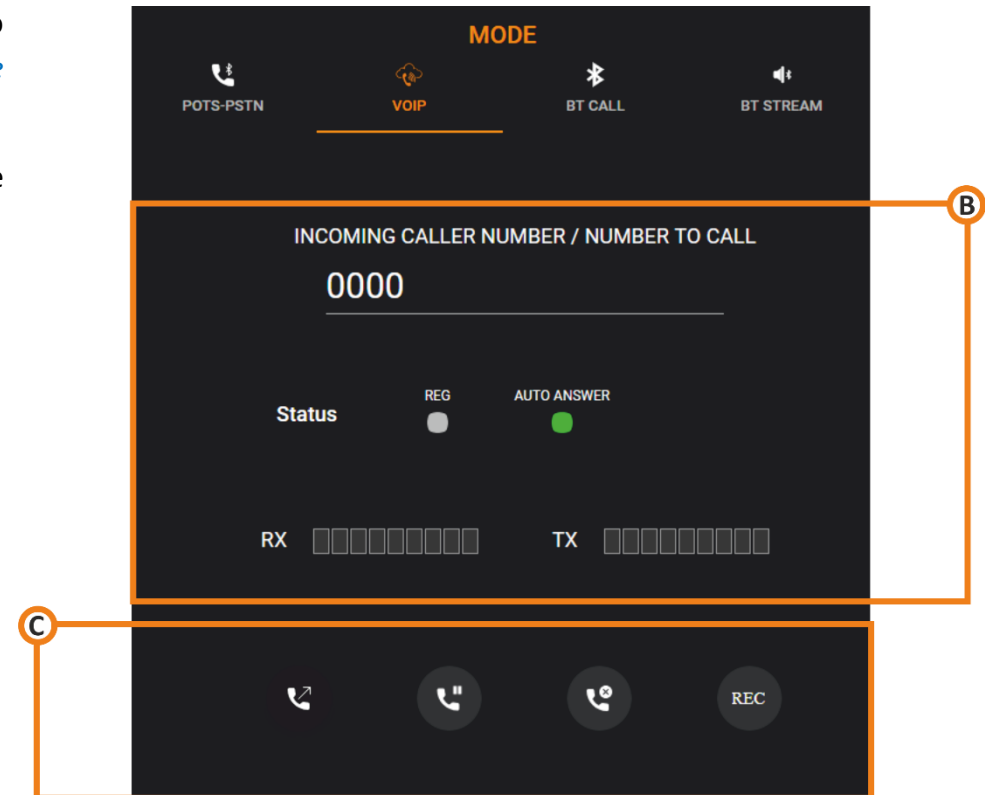
ONCALL: this one to indecate that is a telephone call in the moment when it is not able to change the MODE.

RX: RX level, the audio level receipt (input audio level).

TX: TX level, the audio level sent (output audio level).

C - MODE OPERATIONS

-  **CALL / ANSWER**
-  **PAUSE / HOLD**
-  **DECLINE or End the call**
-  **Recording the call**

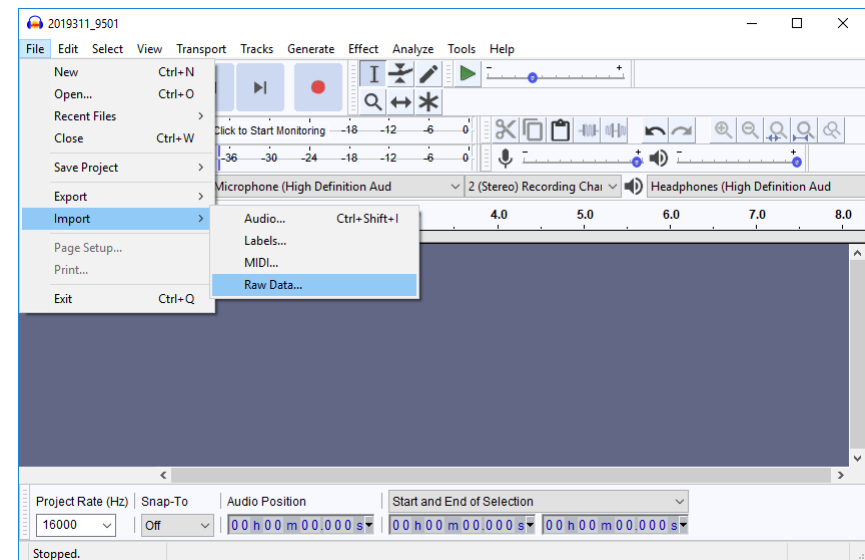


Recording the call: Call Recording is required. An external USB memory drive “flash drive, memory stick” connected to the device by the **USB** Port typeA at the front panel. Otherwise you can record sound and store it via **RTP** protocol for delivering audio over IP NETWORKS.

the record format is .pcm “**Pulse-code modulation**” is a method used to digitally represent sampled analog signals. It is the standard form of digital audio in computers, compact discs, digital telephony and other digital audio applications.

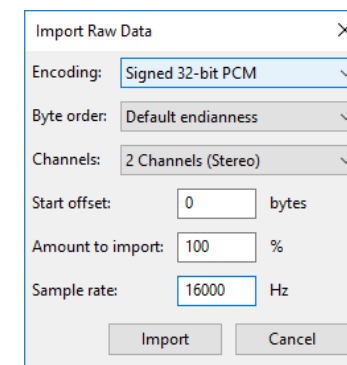
If you are using **Audacity**, it is recommended follow the following settings in order to listen to the recorded material correctly.

1. Select File -> Import -> Raw Data.. from the menu.
2. Select the raw PCM data to import.



Enter the following details if they are not automatically detected:

3. Encoding: Signed 32-bit PCM
4. Byte order: Default endianness
5. Channels: 1 Channel (Mono)
6. Start offset: 0 bytes
7. Amount to import: 100%
8. Sample rate: 16000 Hz
9. Click Import.

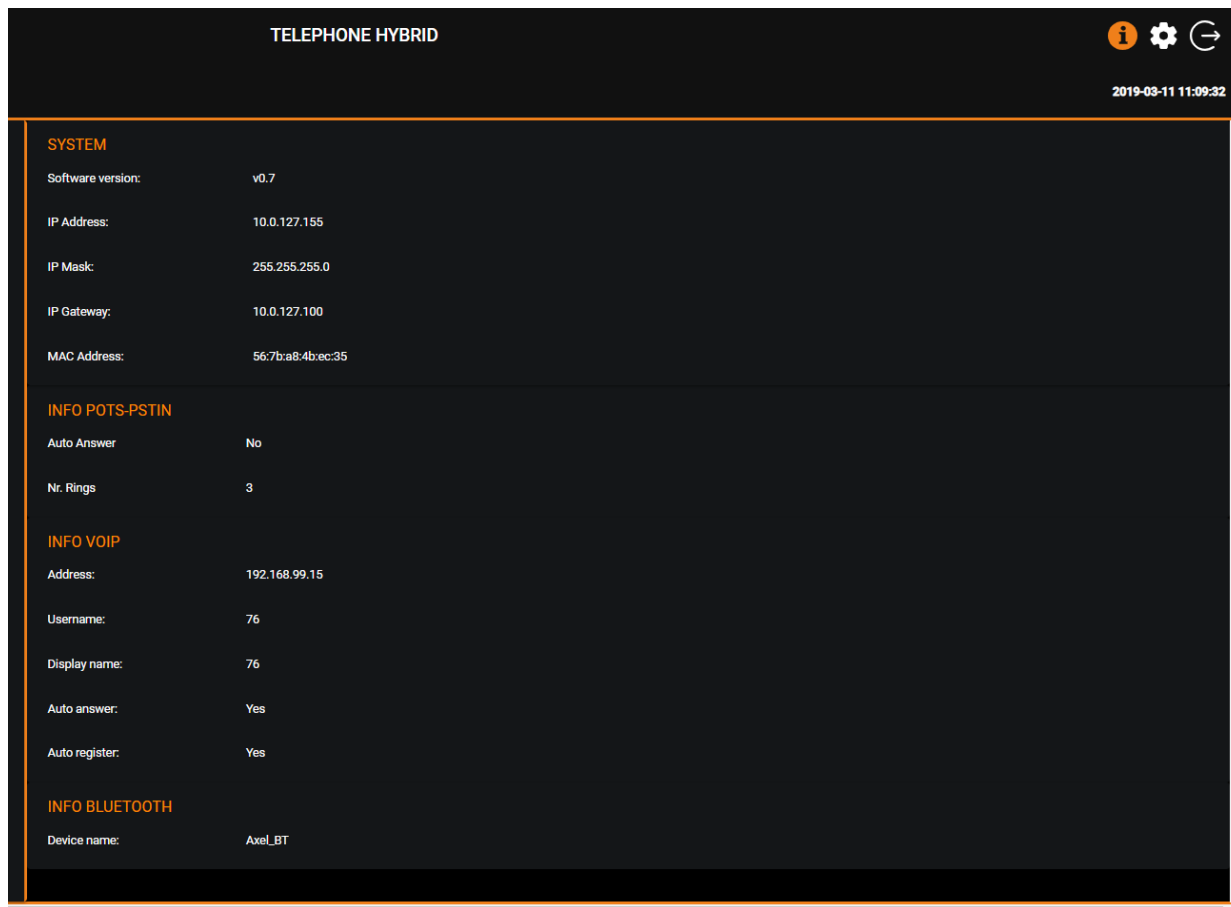


2.3 CONFIGURATIONS ZONE

This area interacts with information and settings icons.

INFO

In the next figure can see the INFO icon is active and it is shown some important information of the system and all active MODEs (POTS-PSTN, VOIP, and BT).



The screenshot displays the 'TELEPHONE HYBRID' configuration interface. At the top right, there are icons for information (i), settings (gear), and refresh (circular arrow), along with the timestamp '2019-03-11 11:09:32'. The main content area is divided into four sections: SYSTEM, INFO POTS-PSTN, INFO VOIP, and INFO BLUETOOTH. Each section contains a list of configuration parameters and their values.

SYSTEM	
Software version:	v0.7
IP Address:	10.0.127.155
IP Mask:	255.255.255.0
IP Gateway:	10.0.127.100
MAC Address:	56:7b:a8:4b:ec:35

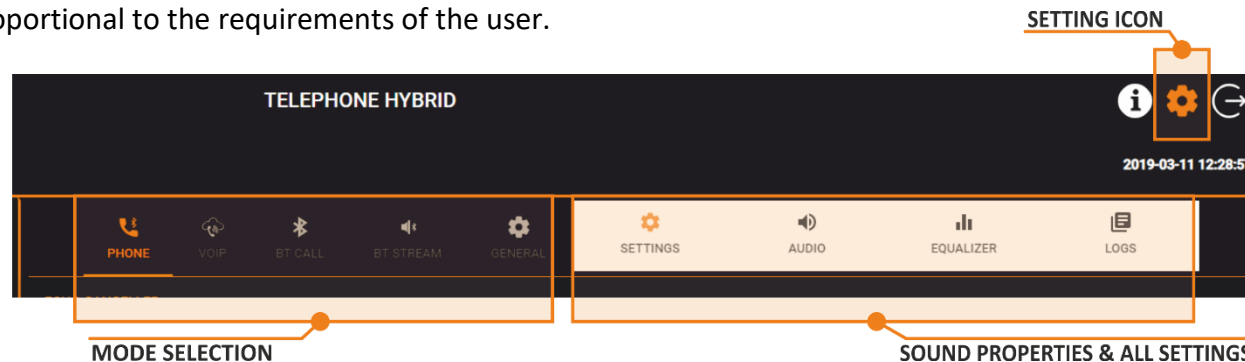
INFO POTS-PSTN	
Auto Answer	No
Nr. Rings	3

INFO VOIP	
Address:	192.168.99.15
Username:	76
Display name:	76
Auto answer:	Yes
Auto register:	Yes

INFO BLUETOOTH	
Device name:	Axel_BT

SETTINGS

By clicking on the Settings icon, you can access all the modes settings available to modify it to get the best efficiency and effectiveness in proportional to the requirements of the user.

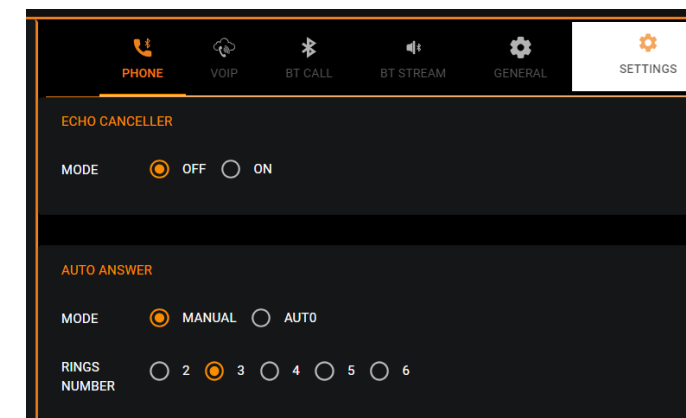
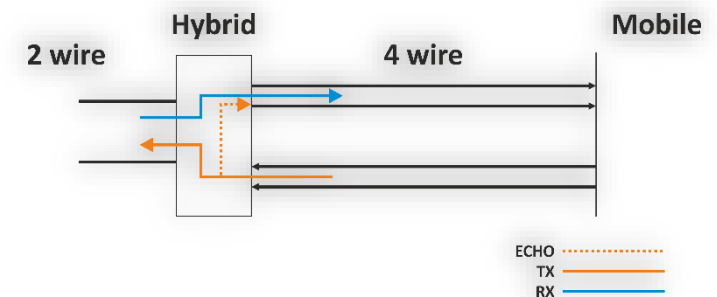


2.3.1 PHONE SETTINGS

Echo Canceller: it's nothing but the process to remove duplicate signal or delayed signal, An **EC** "Echo Canceller" is used on the **PSTN** side of the **MSC** "Mobile Switching Center" for all voice circuits. Echo control is required at the switch because the inherent **GSM** system delay can cause an unacceptable echo condition, even on short distance **PSTN** circuit connections.

The total round trip delay introduced by the **GSM** system (the cumulative delay caused by call processing, speech encoding and decoding etc) is approximately **180 ms**. this would not be apparent to the MS subscriber, but for the inclusion of a **2-wire** to **4-wire** hybrid transformer in the circuit. This is required at the land party's local switch because the standard telephone connection is 2-wire. that is carefully designed to avoid feedback and echo in a conference or telephone interface

AUTO ANSWER: With this function can automatically answer incoming calls when it detects. That is also able to select the number of rings before answering automatically.



2.3.2 VOIP SETTINGS

Voice over IP (VoIP) defines a way to carry voice calls over an IP network including the digitization and packetization of the voice streams. IP Telephony utilizes the **VoIP** standards to create a telephony system where higher level features such as advanced call routing, voice mail, contact centers, etc., can be utilized.

Prerequisites:

The device must be connected to the router and the router is connected to the internet. And that is need an account with a **VoIP** provider.

VOIP DATA

Register: SIP server IP address

User name: The user name used to authenticate this line registration.

Password: The password used to authenticate this line registration.

Display name: The display name used in SIP signaling that your phone uses as the default caller ID. This name is displayed on the call recipient's phone.

OPTIONS

SIP Port: The **Session Initiation Protocol (SIP)** is a signaling protocol for Internet multimedia conferencing and communications, such as **Voice over IP (VoIP)**. It is extensively used on **VoIP** architectures. **Ports 5060 and 5061**, both on **TCP** and **UDP**, are associated to the **Session Initiation Protocol (SIP)**.

RTP Port: Realtime Transport Protocol. **RTP** in general is described in **RFC 3550**. This range is not registered (it never could be, being so broad) but it seems to be somewhat common. See Are there specific ports assigned to **RTP (16384-32767)**.

Auto-answer: With this function can automatically answer incoming calls when it detects from **VOIP**.

Auto-register: It's allow the device to register automatically to the **VOIP** server each time it is turned on and connected.

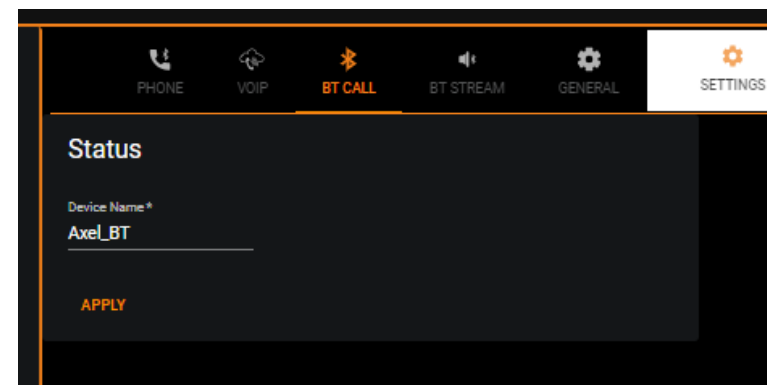
The screenshot shows the 'VOIP' settings page. At the top, there's a navigation bar with icons for PHONE, VOIP (highlighted), BT CALL, BT STREAM, GENERAL, and SETTINGS. Below this, the page is split into two main sections: 'VOIP DATA' and 'OPTIONS'. The 'VOIP DATA' section has four input fields: 'Registrar *' with the value '192.168.99.15', 'User name *' with '76', 'Password *' with '..', and 'Display name *' with '76'. A 'REGISTER' button is at the bottom of this section. The 'OPTIONS' section has four settings: 'SIP Port *' set to '5060', 'RTP Port *' set to '30481', 'Auto answer' set to 'ENABLED' with a dropdown arrow, and 'Auto-register' set to 'ENABLED' with a dropdown arrow. An 'APPLY' button is at the bottom of this section.

2.3.3 BT CALL SETTINGS

STATUS

Device Name: Here is show up the BT device name. that is able to change it then you have to remove it from your smartphone and research again to find the new name assigned.

NOTE: The BT device name will not appare until you change the name. Also it is can not fond if the device is not in **BT CALL** or **BT STREAM**.

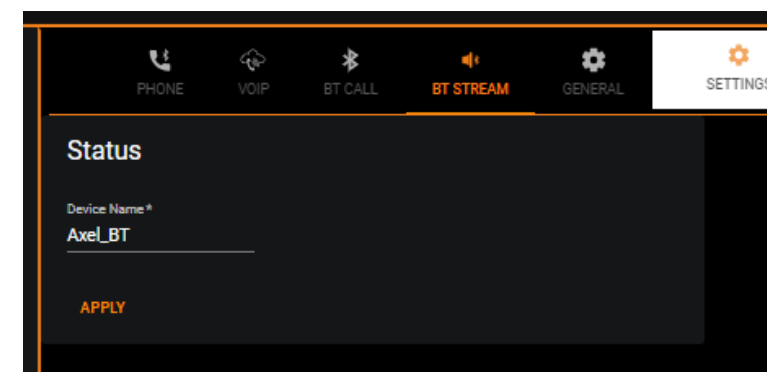


2.3.4 BT STREAM SETTINGS

STATUS

Device Name: Here is show up the BT device name. that is able to change it then you have to remove it from your smartphone and research again to find the new name assigned.

NOTE: The BT device name will not appare until you change the name. Also it is can not fond if the device is not in **BT CALL** or **BT STREAM**.



2.3.5 GENERAL SETTINGS

CHANGE PASSWORD:

Each user can change the password from here by typing the new password and confirming it again, and clicking on the Apply button. You will then need to log out and log in again using the new password.

NETWORK SETTINGS:

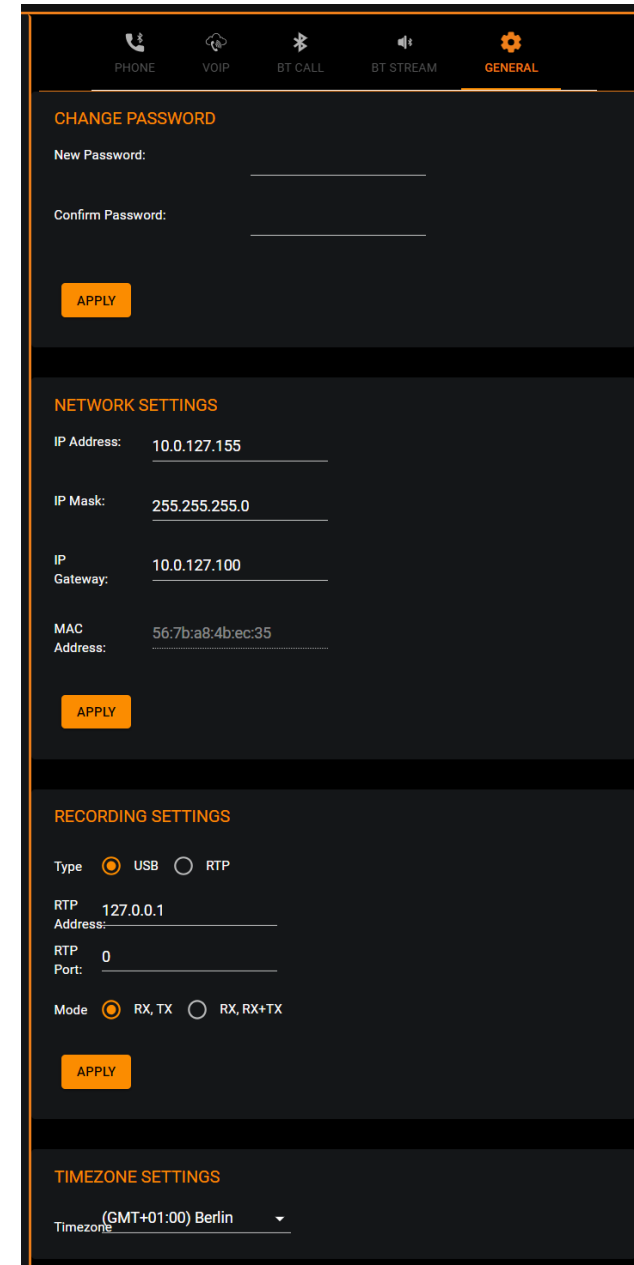
Here you have to manually enter the network settings yourself. This topic assumes that you already know the correct settings to use. If not, you may need to ask your network administrator or look at the settings of your router or network switch.

RECORDING SETTINGS:

Type USB: See page 31.

Type RTP: The **Real-time Transport Protocol (RTP)** is a network protocol for delivering audio and video over IP networks. **RTP** is used in communication and entertainment systems that involve streaming media, such as telephony, video teleconference applications including WebRTC, television services and web-based push-to-talk features. **RTP** is designed for **end-to-end, real-time**, transfer of streaming media.

TIMEZONE SETTINGS: By selecting your timezone you can set the device localtime. Also all audio recorded will be saved in the name (current date and time).



CHANGE PASSWORD

New Password:

Confirm Password:

APPLY

NETWORK SETTINGS

IP Address:

IP Mask:

IP Gateway:

MAC Address:

APPLY

RECORDING SETTINGS

Type ☒ USB ☐ RTP

RTP Address:

RTP Port:

Mode ☒ RX, TX ☐ RX, RX+TX

APPLY

TIMEZONE SETTINGS

Timezone:

AUDIO

RX Gain: To adjust the audio received from the caller. Set here the desired input gain. The **GAIN** affects at the input level with **+/- 20dB**. The step of the GAIN adjustment slider is **1 dB**.
Can also increase or decrease the input gain from the buttons at the frontpanel.

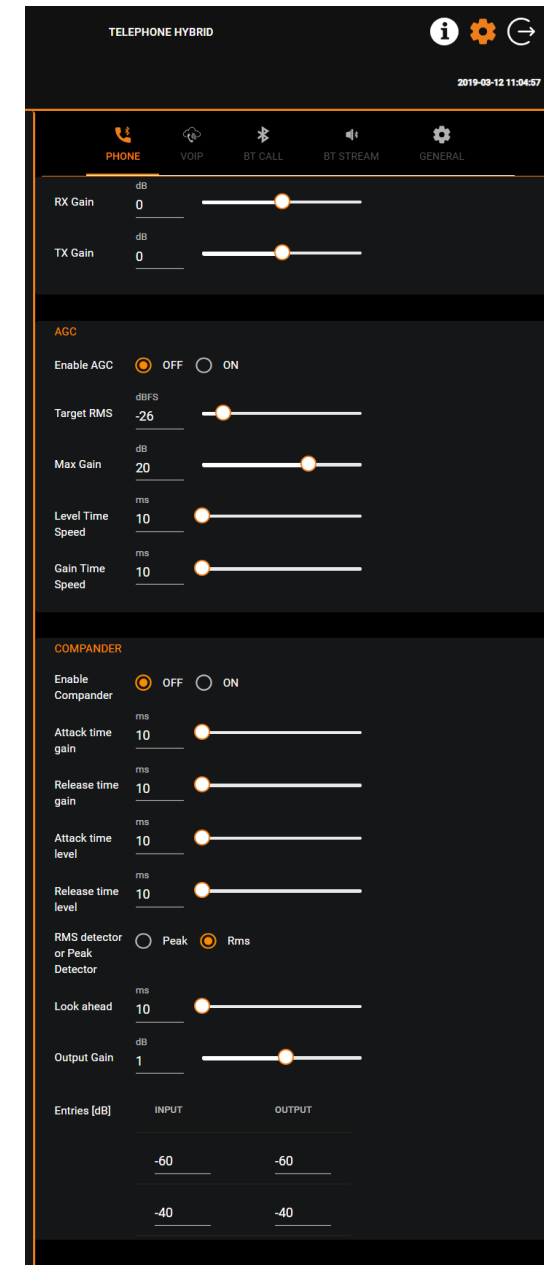
TX Gain: To adjust the audio sent to the caller. Set here the desired output gain. The **GAIN** affects at the output level with **+/- 20dB**. The step of the GAIN adjustment slider is **1 dB**.
Can also increase or decrease the output gain from the buttons at the frontpanel.

AGC: This setting helps balance the audio level. Some of the analogue conventional and trunked radio systems do not include components with **(AGC) Automatic Gain Control** to help normalize the audio levels of analogue transmissions in the system. This can result in a low-level audio signal if a user on the system is not speaking close enough to their radio microphone.

COMPANDER: is a method of mitigating the detrimental effects of a channel with limited dynamic range. The use of companding allows signals with a large dynamic range to be transmitted over facilities that have a smaller dynamic range capability. Companding is employed in telephony and other audio applications such as professional wireless microphones and analog recording.

Attack Time: This refers to the time it takes for the signal to become fully compressed after exceeding the threshold level.

Release Time: This is literally the opposite of attack time. More specifically, it is the time it takes for the signal to go from the compressed—or attenuated—state back to the original non-compressed signal.

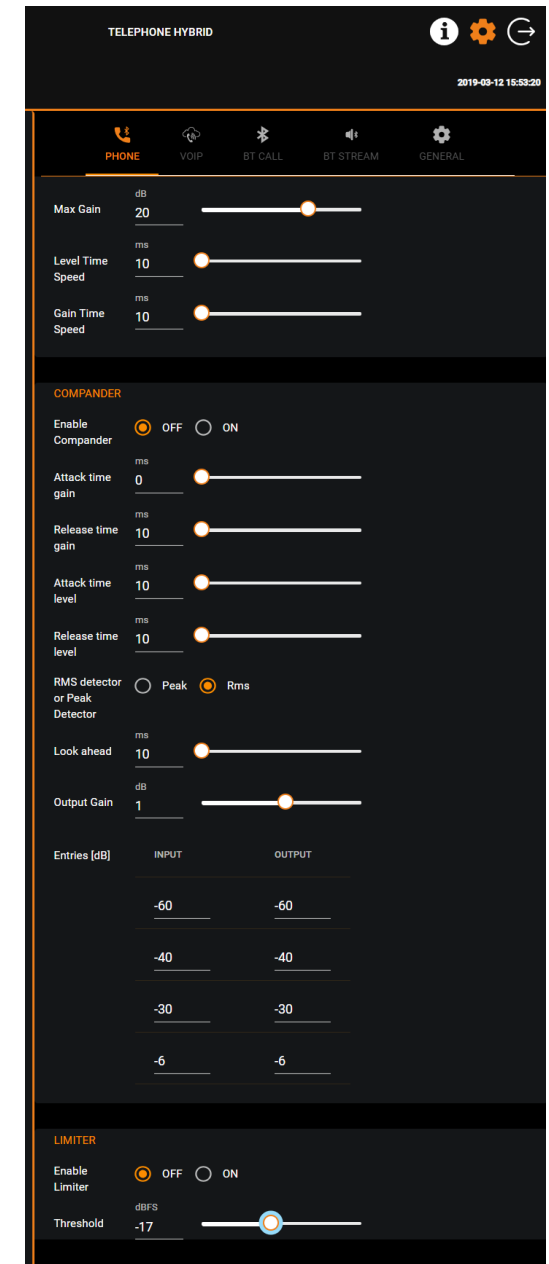


RMS detector: ('Root Mean Square') voltage is a complicated-sounding engineering measure of the average voltage level of electrical signals. Because the **RMS** meter measures 'average' levels, a sustained sound reads much higher than a brief percussive one, even when both sounds have the same maximum voltage level: the reading is dependent on both the amplitude and the duration of peaks in the signal. It is intentionally a "slow" measurement, averaging out peaks and troughs of short duration to reflect the perceived loudness of the material. **RMS** meters approximate the way your ear perceives sound levels; your ear will typically not perceive sharp peaks to be as loud as they really are.

PEAK detector: A peak meter is a type of visual measuring instrument that indicates the instantaneous level of an audio signal that is passing through it (a sound level meter). Peak type metering is designed to respond so quickly that the meter display reacts in exact proportion to the voltage of the audio signal. This can be useful in many applications, but it should be noted that the human ear works much more like an average meter than a peak meter, and thus, many audio engineers and sound professionals prefer to use older analog style metering because it more accurately relates to what a human listener will experience in terms of relative loudness.

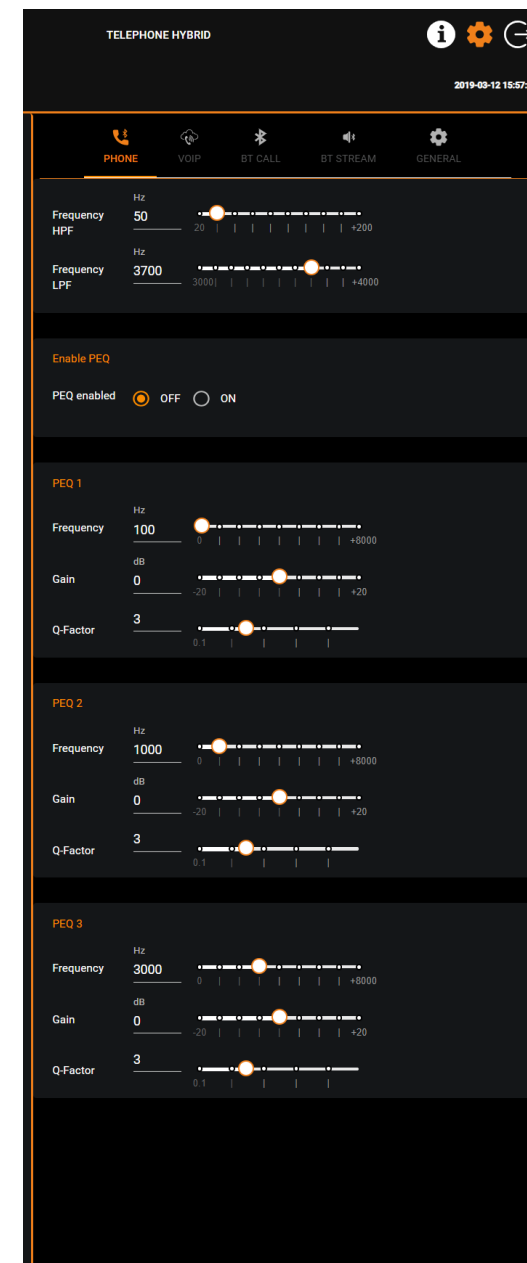
LIMITER: Threshold limiter is a type of compressor designed for a specific purpose to reduces the level of an audio signal if it's amplitude exceeds a certain threshold. The threshold is commonly set in decibels dB, where a lower threshold -30 dB means a larger portion of the signal is treated. When the signal level is below the threshold, no processing is performed and the input signal is passed, unmodified to the output. Thus, a higher threshold of 0 dB, results in less processing, less compression.

Limiters are used as a safeguard against signal peaking (**clipping**). They prevent occasional signal peaks which would be too loud or distorted. Limiters are often used in conjunction with a compressor. The compressor provides a smooth roll-off of higher levels and the limiter provides a final safety net against very strong peaks.



EQUALIZER

The equalizers that provide an adjustable audio band. An equalizer allows the sound in specified frequency bands to be amplified or reduced, in order to adjust the quality and character of the sound.



3 WEEE DIRECTIVE – INFORMATIVA RAEE



In line with EU Directive 2002/96/EC for waste electrical and electronic equipment (WEEE), this electrical product must not be disposed of as unsorted municipal waste. Please dispose of this product by returning it to the point of sale or to your local municipal collection point for recycling.

In Übereinstimmung mit der Richtlinie 2002/96/EG des Europäischen Parlaments und des Rates über Elektro- und Elektronik-Altgeräte (WEEE) darf dieses Elektrogerät nicht im normalen Hausmüll oder dem Gelben Sack entsorgt werden. Wenn Sie dieses Produkt entsorgen möchten, bringen Sie es bitte zur Verkaufsstelle zurück oder zum Recycling-Sammelpunkt Ihrer Gemeinde.

Conformément à la Directive 2002/96/EC sur les déchets d'équipements électriques et électroniques (DEEE), ce produit électrique ne doit en aucun cas être mis au rebut sous forme de déchet municipal non trié. Veuillez vous débarrasser de ce produit en le renvoyant à son point de vente ou au point de ramassage local dans votre municipalité, à des fins de recyclage.

In navolging van richtlijn 2002/96/EG van het Europees Parlement en de Raad betreffende afgedankte elektrische en elektronische apparatuur (AEEA) mag dit elektrische product niet als ongescheiden huisvuil worden weggedaan. Breng dit product terug naar de plaats van aankoop of naar het gemeentelijke afvalinzamelingspunt voor recycling.

In ottemperanza alla Direttiva UE 2002/96/EC sui rifiuti di apparecchiature elettriche ed elettroniche (RAEE), questo prodotto elettrico non deve essere smaltito come rifiuto municipale misto. Si prega di smaltire il prodotto riportandolo al punto vendita o al punto di raccolta municipale locale per un opportuno riciclaggio.

De conformidad con la Directiva 2002/96/CE de la UE sobre residuos de aparatos eléctricos y electrónicos (RAEE), este producto eléctrico no puede desecharse con el resto de residuos no clasificados. Deshágase de este producto devolviéndolo al punto de venta o a un punto de recogida municipal para su reciclaje.

I henhold til EU-direktiv 2002/96/EF om affald af elektrisk og elektronisk udstyr (WEEE) må dette udstyr ikke bortskaffes som usorteret husholdningsaffald. Bortskaf dette produkt ved at returnere det til salgsstedet eller til det lokale indsamlingssted, så det kan genbruges.

I linje med EU-direktiv 2002/96/EG om avfall som utgörs av eller innehåller elektriska eller elektroniska produkter (WEEE) får denna elektriska produkt inte bortskaffas som osorterat kommunalt avfall. Bortskaffa den i stället genom att lämna in den på försäljningsstället eller din lokala återvinningsstation.

EU:n sähkö- ja elektroniikkalaiteromudirektiivin (2002/96/EY) mukaisesti tätä elektroniikkalaitetta ei saa laittaa lajittelemattoman yhdyskuntajätteen sekaan. Hävitä laite palauttamalla se ostopaikkaan tai viemällä se elektroniikkaromun keräyspisteeseen.

De acordo com a Directiva Europeia 2002/96/EC sobre resíduos sólidos de equipamento eléctrico e electrónico (WEEE), este produto eléctrico não pode ser deixado fora juntamente com o lixo municipal indiferenciado. Por favor, no final da vida útil deste produto, devolva-o ao estabelecimento de aquisição, ou entregue no local de recolha apropriado para reciclagem designado pelo seu município.

V souladu se smrnici EU . 2002/96/ES o odpadních elektrických a elektronických zaYízeních (OEEZ) se tento elektrický výrobek nesmí likvidovat jako netYídný komunální odpad. PYi likvidaento výrobek vraťte prodejci nebo ho odevzdejte k recyklaci do komunálního sborného zaYízení.

Vastavalt EL direktiivile 2002/96/EÜ, mis käsitleb elektri- ja elektroonikaseadmete jäätmeid (WEEE), ei või antud toodet visata majapidamisjäätmete hulka. Palun tagastage antud toode taaskasutamise eesmärgil müügipunkti või kohaliku piirkonna jäätmekogumise punkti.

V súlade so smernicou 2002/96/ES o odpade z elektrických a elektronických zariadení (OEEZ) sa toto elektrické zariadenie nesmie odstranovať ako netriedený komunálny odpad. Výrobok odstráňte jeho vrátením v mieste nákupu alebo odovzdaním v miestnom zbernom zariadení na recyklovanie.

V súlade so smernicou 2002/96/ES o odpade z elektrických a elektronických zariadení (OEEZ) sa toto elektrické zariadenie nesmie odstranovať ako netriedený komunálny odpad. Výrobok odstráňte jeho vrátením v mieste nákupu alebo odovzdaním v miestnom zbernom zariadení na recyklovanie.

4 WARRANTY

The manufacturer offers a one-year warranty ex-works. Do not open the equipment. Any breaking of the seals will result in forfeiture of the same. The manufacturer is not liable for damages of any kind arising from, or in connection with, the use of the wrong product.