

Macrotel

5-7-9

Studio Telephone Hybrid

Operating manual

(Rel. 1.3)



Via Caduti Di Sabbiuno 6/F - 40011 Anzola Emilia - Bologna - Italy - Tel. +39 051 736555 - Fax. +39 051 736170
e-mail: info@axeltechnology.com - web site: www.axeltechnology.com

This manual is for use with the following product :

Macrotel 5, Macrotel 7, Macrotel 9

Axel Technology SRL

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Via Caduti Di Sabbiano 6/F - 40011 Anzola Emilia - Bologna - Italy
Tel. +39 051 736555 – + 39 051 736154
Fax. +39 051 736170
e-mail: info@axeltechnology.com - web site: www.axeltechnology.com

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2 INTRODUCTION

Macrotel is a range of professional, analog telephone hybrids, 2/4 wires, especially designed to satisfy all TV and radio studio requirements. All the models offer an high level technical performance at a very competitive price.

Main features are:

- Balanced audio inputs and outputs on XLR connectors with level control on the front panel.
- 2 wire interface with parallel connection to an external telephone set.
- Transformer balanced 4 wire interface (PLUS version).
- Remote control of the following functions: line hooking, meeting enable, incoming call signalling.
- MEETING* function.
- Led meter showing Send, Receive or Meeting levels.
- Automatic line compensation.
- Fully modular structure.

Macrotel range:

Macrotel 5: 1 telephone line hybrid

Macrotel 7: 2 telephone line hybrid

Macrotel 9: 1 telephone line hybrid, featuring also: supplementary input/output for microphone and headphone set + one REC balanced output.

- *allows system expansion through other Macrotel units*

This appliance is connected to telephone networks indirectly through interface (in-house telephone exchange). Direct connection to the public telephone net is under sole responsibility of the user.

3 SAFETY WARNINGS / ISTRUZIONI PER LA SICUREZZA

SAFETY WARNINGS
CONSIGNES DE SÉCURITÉ IMPORTANTES
ISTRUZIONI IMPORTANTI PER LA SICUREZZA
WICHTIGE SICHERHEITSHINWEISE
INSTRUCCIONES IMPORTANTES DE SEGURIDAD

(Rel. 1.1)

3.1 FOREWORD

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



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 authorised agents. The manufacturer cannot accept any liability whatsoever for any loss or damage caused by service, maintenance or repair by unauthorised personnel.

4 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 Yr 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 nor 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 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.

5 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 replacer 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.

6 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.







7 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 hineinfließen, 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**.

	<i>Dieses Symbol zeigt an, dass gefährliche Spannungswerte, die ein Stromschlagrisiko darstellen, innerhalb dieses Geräts auftreten.</i>
	<i>Dieses Symbol zeigt an, dass das diesem Gerät beiliegende Handbuch wichtige Betriebs- und Wartungsanweisungen enthält.</i>
	Vor Änderung der Netzspannung oder Sicherungswchsel 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

8 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 .

	<i>Este símbolo indica que la unidad contiene niveles de voltaje peligrosos que representan un riesgo de choques eléctricos.</i>
	<i>Este símbolo indica que la literatura que acompaña a esta unidad contiene instrucciones importantes de funcionamiento y mantenimiento.</i>
	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.
	Replazze 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.

9 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 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 are 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.

Manufacturer		CE	
Model :	XXX	S-N :	KKKK
<input type="checkbox"/>	230V 50/60Hz	VA fuse	mAT
<input type="checkbox"/>	115V 50/60Hz	VA fuse	mAT

Tools And Equipment Needed

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

10 FIRST INSTALLATION RECOMMENDATIONS

10.1 POWER SUPPLY CABLE

A power supply cable of approx. 2 mt length is supplied with the device, which has a moulded 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.

10.2 AC MAINS VOLTAGE SETTING (230 V / 115 V)



BE SURE THAT THE UNIT IS SET TO THE CORRECT MAINS/LINE VOLTAGE FOR YOUR COUNTRY BEFORE PLUGGING IT INTO THE WALL OUTLET !

The actual Mains voltage is indicated on the label stuck on the equipment closure. Should the type of power at the operation location not be known, please contact your dealer or electricity company.

Manufacturer			
Model :	XXX	S-N :	KKKK
<input type="checkbox"/>	230V 50/60Hz	VA fuse	mAT
<input type="checkbox"/>	115V 50/60Hz	VA fuse	mAT

If, for some reason, the unit is to be operated at a mains input voltage which is different to that as supplied, you need to open the top cover and set properly the **voltage change-over switch** which is located inside, close to the transformer. You also need to replace the AC main fuse, according to information provided on the external label or on the Technical Specifications table at the end of this user manual.



CAUTION: TO REDUCE THE RISK OF ELECTRICAL SHOCK, ALWAYS DISCONNECT THE AC MAINS CABLE BEFORE ALTERING THE CHANGE-OVER SWITCH. NO USER SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

10.3 FUSE REPLACEMENT

The power supply socket has an integral fuse drawer containing the AC power fuse and a spare, both of the same value.



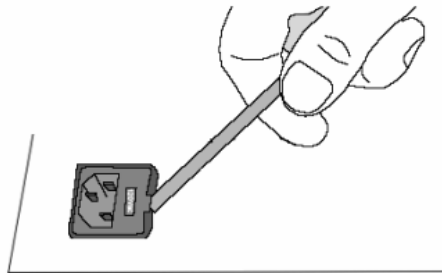
BEFORE REPLACING THE POWER FUSE, MAKE SURE YOU HAVE THE RIGHT TYPE OF FUSE FOR THE VOLTAGE TO BE PROTECTED. USING WRONG FUSE TYPE WILL RESULT IN INSUFFICIENT PROTECTION.

Make sure that the power is switched off and the power cable is disconnected from the equipment.

Open the fuse drawer using a small blade screwdriver.

Replace the fuse located at the inner position

Push the fuse socket back into the original position



Perform the set-up under static control conditions. Static charges are likely to completely destroy one or more of the CMOS semiconductors employed in the unit. Static damage will not be covered under warranty.

Basic damage prevention consists of minimizing generation, discharging any accumulated static charge on your body and preventing that discharge from being sent to or through any electronic component.



Uninsulated dangerous voltage are inside the enclosure, voltage that may be sufficient to constitute a risk of shock.

Always disconnect to AC Mains before removing the top cover

10.4 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 and the telephone line 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.

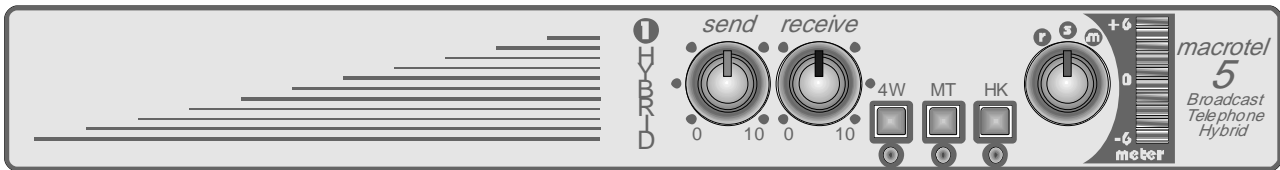
10.5 VENTILATION

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.

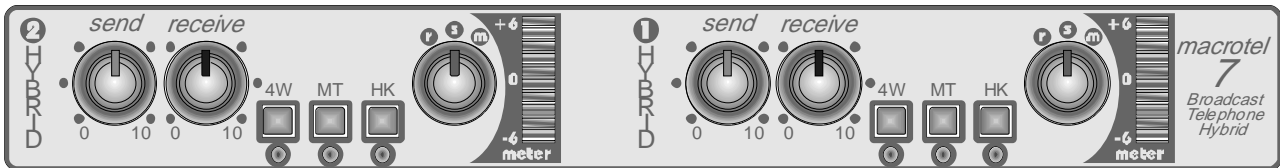
YOU MUST LEAVE AT A MINIMUM ONE RACK UNIT OF EMPTY SPACE ABOVE THE EQUIPMENT TO ENHANCE VENTILATION AND TO GET A LONGER EQUIPMENT LIFE.

11 EQUIPMENT DESCRIPTION

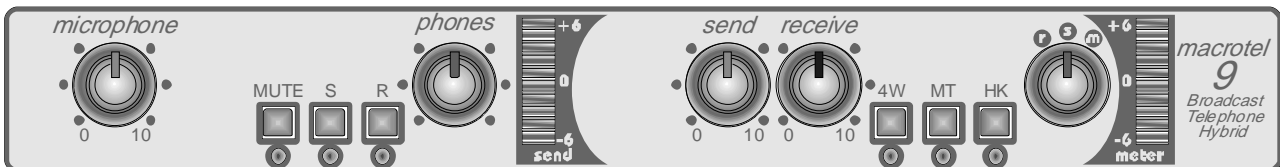
11.1 FRONT PANELS



Macrotel5



Macrotel7

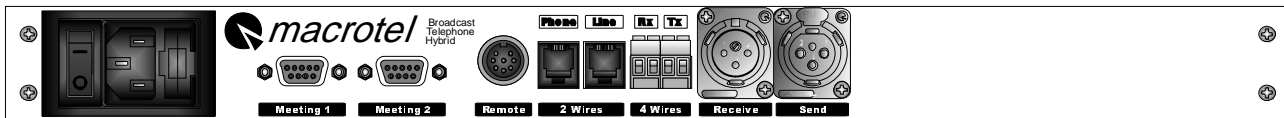


Macrotel9

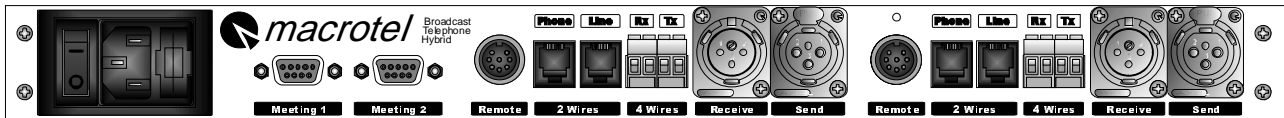
- **Send potentiometer:** it adjusts the level of audio signal sent to phone caller via 2 or 4 wire connection
- **Receive potentiometer:** it adjusts the phone subscriber audio level which is provided to the user 's equipment and which comes through 2 or 4 wire connection in.
- **4W button:** it switches between 2 Wire / 4 Wire connection modes.
- **MT button:** it enables Meeting function
- **HK button:** it allows Line hooking. This switch connects / disconnects the hybrid from only the 2 WIRE telephone line. *Hook* led blinks when a call (ring) is coming in and lights firmly while line is hooked. Please note: led switches on only if phone line is connected.
- **R,S,M selector:** It selects audio source to be showed by led meter (Receive, Send , Meeting).
- **Led Bar meter:** it shows Send, Receive or Meeting levels (switched)
- **Microphone potentiometer*:** it adjusts the microphone input level
- **Mute button*:** it mutes microphone input
- **S button*:** it enables listening to Send signal via headphone output
- **R button*:** it enables listening to Receive signal via headphone output
- **Phones potentiometer*:** it adjust headphone volume
- **Send led bar*:** it shows Send signal level

* Available on Macrotel9 only

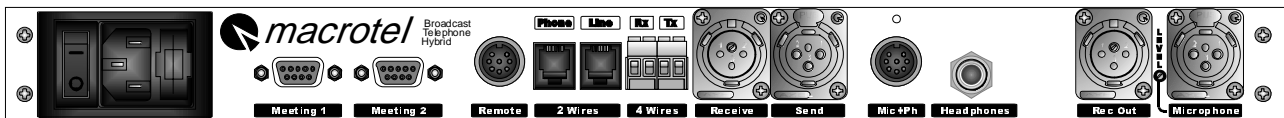
11.2 REAR PANELS



Macrotel 5



Macrotel 7



Macrotel 9

- **ON/OFF main switch**, the led inside switches on/off accordingly. If it is off while the switch is ON, please check the supplied AC cord and the fuse.
- **VDE**: the power supply socket has an integral fuse drawer containing the power fuse and a spare one
 - for 220/230 V AC the fuse is rated at 250 mA T
 - for 110/115 V AC tension the fuse is rated at 500 mA T

the voltage change-over switch is located inside the box, close to the transformer.

- **Meeting 1 and 2**: 9 pole SubD for system expansion through other Macrotel units and for connection of several telephone lines to only one 'Telco' module of mixing console
- **Remote**: Remote control of the functions: line hooking, meeting enable, incoming call signalling
- **2 Wires**: double (paralleled) RJ11 connectors for the telephone line (LINE) and for a standard analog telephone set (f.i. for dialling).
- **4 Wires**: RX + TX terminal blocks for 4 wire lines**
- **Receive XLR (balanced)**: it provides the audio incoming from telephone caller
- **Send XLR (balanced)**: it receives audio from the source (mixing console) and sends it to the telephone caller. Audio sent to caller must be a mix-minus (see § 13.1)
- **Mic + Ph***: 5 pin (DIN) connector providing both a balanced microphone input and a monochannel headphone output.
- **Headphones***: bichannel preamplified output to fit an headphone set
- **Rec Out***: electronically balanced output providing Send+Receive signal
- **Microphone***: electronically balanced input for external microphones. Microphone level may be adjusted by means of the trimmer (*Level*) next to the corresponding connector.

* Available on Macrotel9 only / ** the related connectors are always visible, even if the 4W option is not installed.

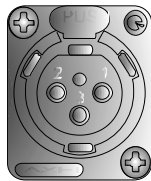
12 WIRING AND CONNECTIONS

We suggest to use high quality wires, well protected, and balanced connections to avoid external EMD.

12.1 AUDIO INPUT (SEND)

The equipment features electronically balanced XLR female inputs (line level).

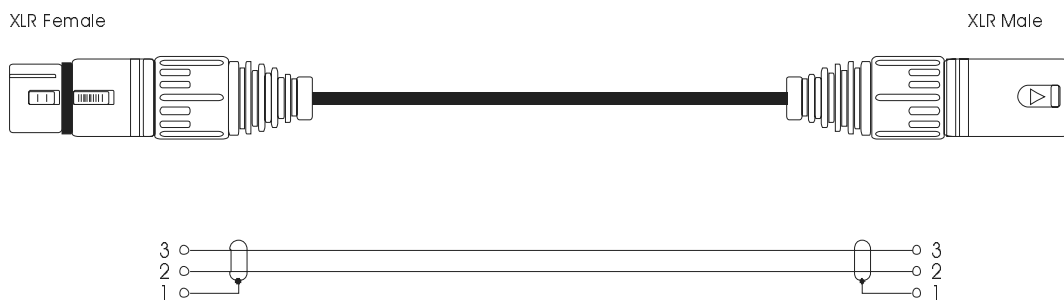
XLR pinout:



Pin 1 - (Gnd)
Pin 2 - Signal
Pin 3 - Return

If any balanced connection is possible, please connect the cold pole (Pin 3) to the ground (Pin 1).

Factory preset input impedance is 10 kOhm. Input impedance of 600 Ohm is also available, simply setting jumpers on the main board (see relevant Chapter).



Example of balanced connection



Example of unbalanced connection

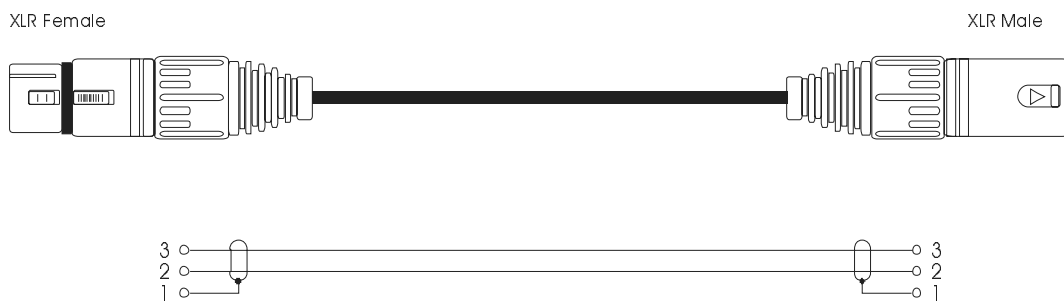
12.2 AUDIO OUTPUT (RECEIVE)

The equipment features XLR analog outputs electronically balanced by high-quality buffers, capable of withstanding even low-impedance loads (600Ohm), with levels of up to +20 dBu.

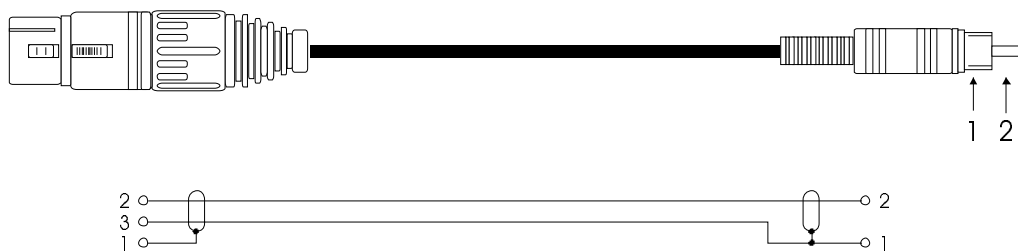


- Pin 1 - (Gnd)
- Pin 2 - Signal
- Pin 3 - Return

In case of unbalanced connections, connect the cold pole (Pin 3) to the ground (Pin 1).



Example of balanced connection

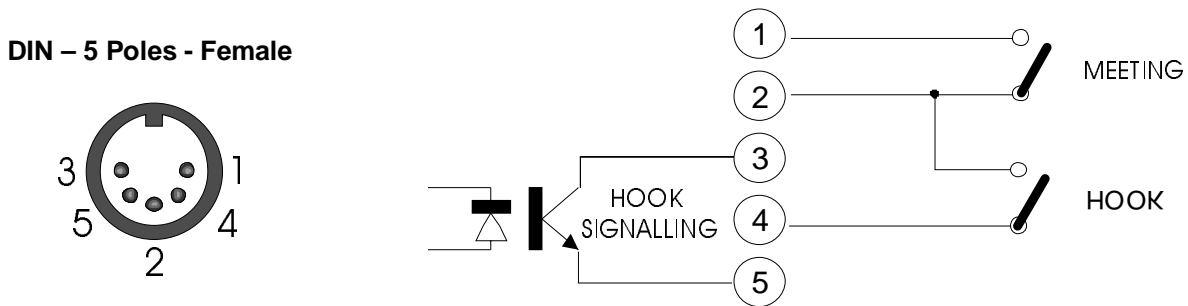


Example of unbalanced connection

12.3 REMOTE INTERFACE

Macrotel remote interface is based on a 5 pole female DIN and allows:

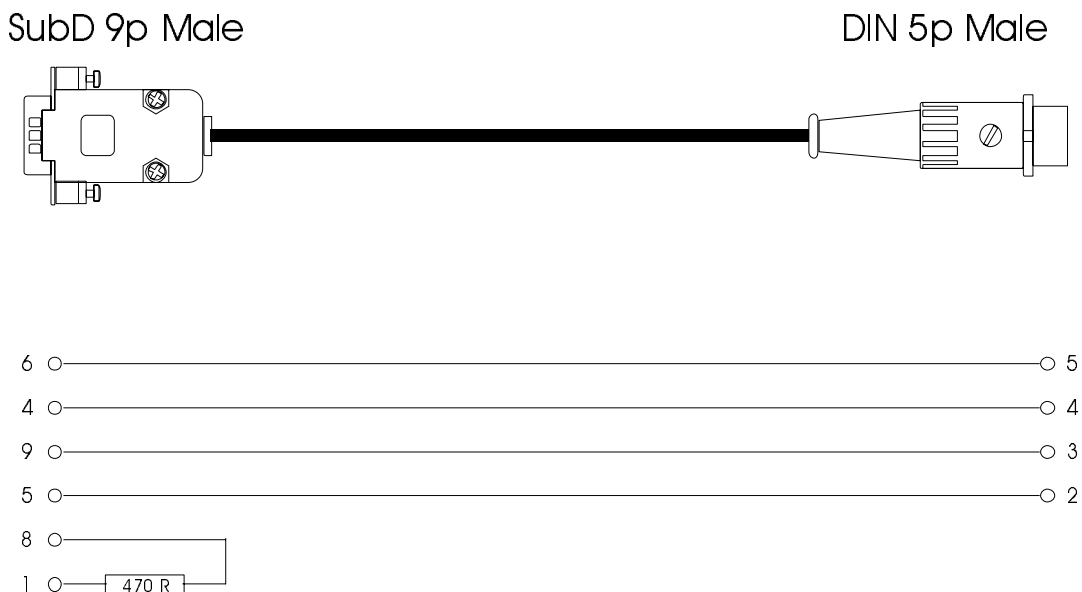
- Remote **hooking** of telephone line (stable contact closure between pins 4 and 2)
- Remote enabling of **Meeting** function (stable contact closure between pins 1 and 2)
- Incoming call signalling. An internal photocoupler (pin 3= collector and pin 5 = emitter) provides a low-resistance closure (150 Ohm) for an arrived call. Max current allowed: 10 mA. Pins 3 and 5 allow connection of an external call signalling system (like **Mr. Light** by **Axel Technology**).



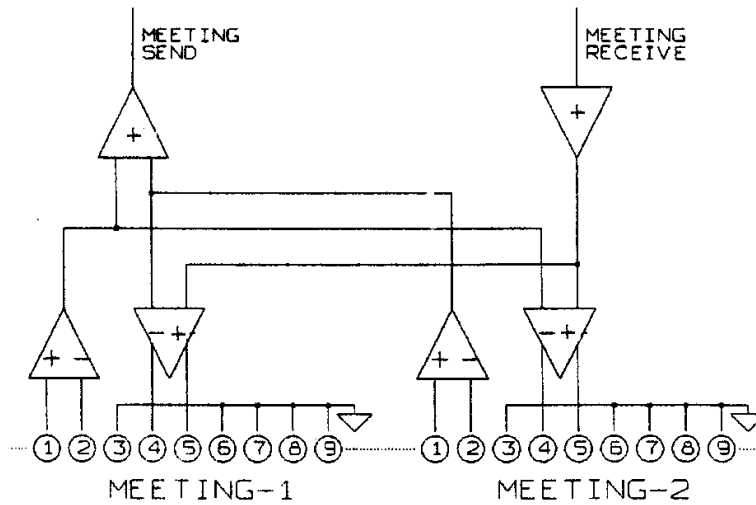
12.4 INTERFACES TO OXYGEN 5 AND OXYGEN 7 CONSOLES

Remote interface allows direct connection of Macrotel equipment to **OXYGEN 5** and **OXYGEN 7** mixing consoles by Axel Technology (TELCO MODULES).

Connection scheme is as following:



12.5 MEETING INTERFACE



Meeting facilities has been designed especially to allow cascade connection of several Macrotel units sharing the same Meeting bus.

The cascade (that may include Macrotel 5, 7 or 9) is fed by a N-1 output*** of mixing console and provides a total 'receive' signal which is the sum of signals received from telephone lines connected to the single hybrids.

Meeting cable requires crossed connection among Pin 1 and 2 and Pins 4 and 5 (see picture above).

Output meeting impedance may be set to 600 Ohms rather to 10 Kohms. Please refer to Chapter 14.

*** Mix-minus (N-1) is a mix of all audio signals being sent to the telephone line, minus the incoming caller audio.

Please refer to parr. 13.4 (MT BUTTON) for further Meeting operation modes.

12.6 TELEPHONE LINE CONNECTION

Macrotel hybrids operate on analog telephone lines.

LINE CONNECTOR	
Pin	Description
1	n.c.
2	Tel line
3	Tel line
4	n.c.

TEL. SET CONNECTOR	
Pin	Description
1	n.c.
2	Tel line
3	Tel line
4	n.c.

NOTES

The Macrotel RJ11 socket will accept 4 conductor modular plugs, but only the **2 central pins (number 2 and 3)** are typically used.

The 'Phone' plug allows the connection on parallel of a standard telephone set (f.i. for dialling services). Please note that 'Phone' socket is always active (i.e. it doesn't depend on the 'Hook' button state).

This appliance is connected to telephone networks indirectly through interface (in-house telephone exchange). Direct connection to the public telephone net is under sole responsibility of the user.



Should the device be put out of action due to being struck by lightning or excess voltage, disconnect it from the telephone line 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.

12.7 4 WIRE CONNECTION **

4 wire connection is provided through two screwed terminal blocks. RX / TX impedance is set at 600 Ohms.

** available as an option (Macrotel PLUS version).

12.8 MICROPHONE CONNECTOR (MACROTEL 9 ONLY)

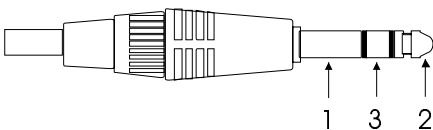


Microphone balanced socket allows connection of external microphones.

Pin 1	Gnd
Pin 2	Signal
Pin 3	Return

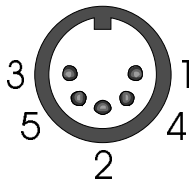
Microphone level may be adjusted through the *Level* trimmer on the rear panel (-50 ÷ -90 dB range) and through the 'Microphone' control on the front panel.

12.9 HEADPHONES JACK (MACROTEL 9 ONLY)



Headphone plug allows connection to an external headphone set. The same mono signal is provided on both Ring (3) and Tip (2) pins, by means of two independent amplifier. Please connect **ONLY STEREO** headphone set, as 'Mono' plugs could damage internal amplifier stage.

12.10 MIC + HEADPH. SOCKET (MACROTEL 9 ONLY)



5 pole DIN connector provides either a balanced Mic input or a MONO headphones output.

Please connect to Macrotel 9 ONLY one headphone (HP) set and one microphone simultaneously.

Connection pinout:

Pin 4	MIC Return	Pin 3	HP Signal
Pin 1	MIC Signal	Pin 5	HP Ground
Pin 2	MIC Gnd		

12.11 REC OUT CONNECTOR (MACROTEL 9 ONLY)



REC OUT connector (mono-balanced). It can feed a recording device to record both the received and sent audio.

REC OUT signal (mono) is electronically balanced on XLR male connector with 0 dB gain. Connector pinout:

Pin 1	Gnd
Pin 2	Signal
Pin 3	Return.

13 FRONT PANEL OPERATION

13.1 SEND CONTROL

It adjusts the level of signal which is sent to the telephone caller via the Send XLR connector. Send control is applied to both 2 wire and 4 wire ** connections (selectable through **4W** button).

Send signal may be composed by:

- the one coming from 'Send' XLR connector (on the rear panel)
- the Meeting signal coming from the Meeting bus (see parr. 12.5 and parr. 13.4). If jumper J12 on the mother board (see Chapter 14) is on its A position (factory preset), connection to Meeting bus is always enabled. If J12 is in its B position, Meeting signal is available only while MT button on the front panel pressed.

NOTE: Audio sent to the caller must be a mix-minus. Mix-minus (N-1) is a mix of all audio being sent to the Send XLR connector of the hybrid, minus the incoming caller audio.

** available as an option (Macrotel PLUS version).

13.2 RECEIVE CONTROL

It controls the level of the signal incoming from telephone caller through 2 wire or 4 wire connection (see **4W** button).

The 'received' signal is provided on the Receive XLR connector (rear panel).

With MT button pressed, received audio may be sent to the Meeting bus, too (see **Block Diagram – Chapter 15**).

13.3 4 W BUTTON**

It allows reception and transmission from/to 2 WIRES lines (button released / LED off) or from/to 4 WIRES lines (button depressed / LED on).

** 4 Wire output is available as an option (Macrotel PLUS version).

13.4 MT BUTTON

Macrotel 7

- With MT button depressed on one channel, the signal received from the related caller is automatically sent to the other caller** and is provided on Meeting SubD connectors (f.i. for cascade connection of several units)
- With MT button depressed on both channels, phone callers can communicate to each other and the signal received from both callers is sent to both SubD Meeting connectors (f.i. for cascade connection of several units).

Macrotel 5 and 9

- With MT button depressed, the signal received from caller is only provided on SubD Meeting connectors (f.i. for cascade connection of several units).

*** the second subscriber may listen to the first without MT button pressed only if J12 jumper is on A position (see block diagram of Chapter 7 and Internal Settings, Chapter 6).*

13.5 HK BUTTON

It allows line 'hooking' in the 2 WIRE mode. This switch hooks / hangs up for a 2 WIRE telephone line only. *Hook* LED blinks when a call is coming in (ring) and lights firmly while line is hooked. Please note: LED switches on only if telephone line is connected.

13.6 METER SELECTION

LED meter shows SEND, RECEIVE or MEETING levels depending on related selector position (*r, s, m*).

13.7 MICROPHONE CONTROL (MACROTEL 9 ONLY)

It adjusts the microphone input level

13.8 MUTE BUTTON (MACROTEL 9 ONLY)

It mutes microphone input. The microphone is muted with the button released.

13.9 S BUTTON (MACROTEL 9 ONLY)

It enables listening to Send signal via headphone output

13.10 R BUTTON (MACROTEL 9 ONLY)

It enables listening to Receive signal via headphone output

13.11 PHONES POTENTIOMETER (MACROTEL 9 ONLY)

It adjusts headphone volume

13.12 SEND LED BAR (MACROTEL 9 ONLY)

It shows Send signal level

14 HARDWARE SETTINGS

14.1 BUZZER DISABLING

Internal buzzer (signalling an incoming call) is factory preset enabled. It may be disabled through the corresponding jumper (J 11, close to it).

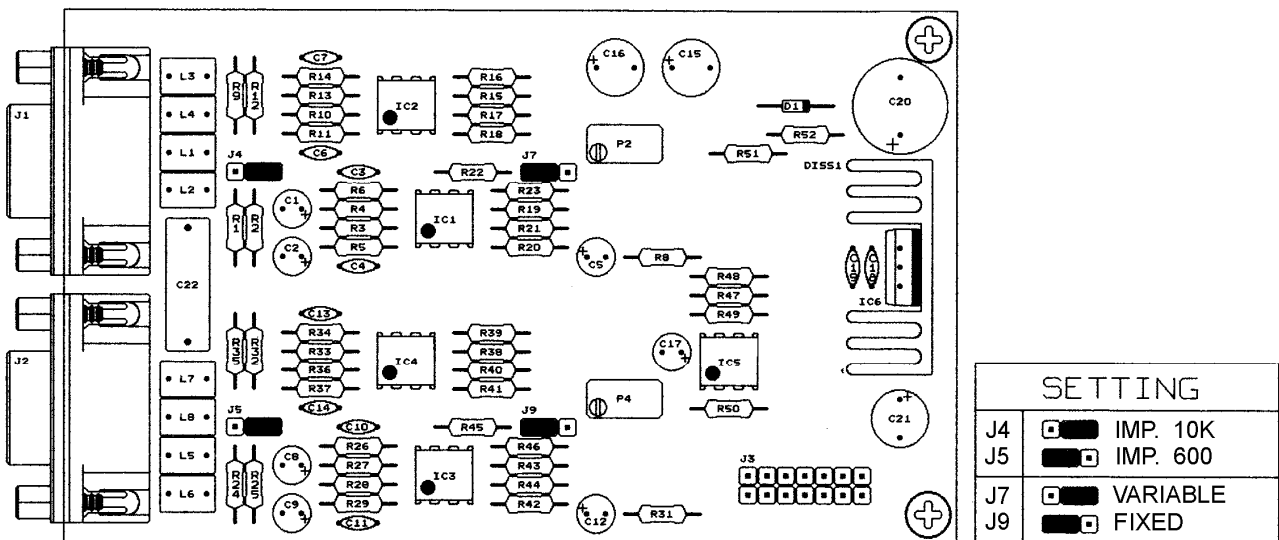
14.2 INPUT IMPEDANCE

At the delivery, 'Send' and Meeting input Impedances are set at 10 Kohm. The impedance may be set to 600 Ohm by moving the jumpers located on the mother board (J10) and on the Meeting board (J4 and J5).

14.3 MEETING OUTPUT LEVEL

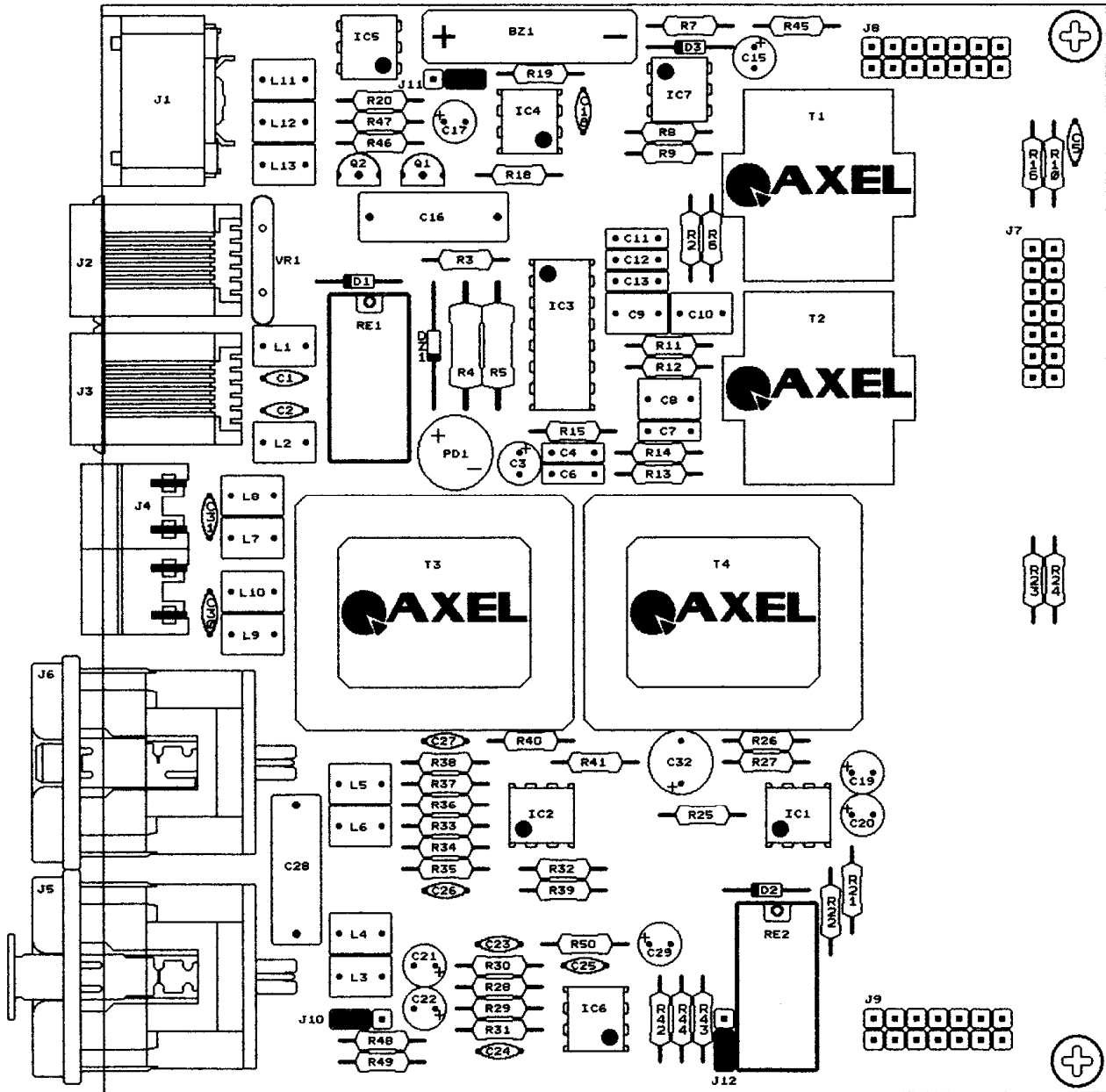
At the delivery it is set to 0 dBm. It can be adjusted in the - 6 dBm - 6 dBm range by means of the trimmer P3 and P4 next to Jumper J 7 and J9 after moving these jumpers to Variable position.

CAUTION: Before moving any jumper setting, please switch off the equipment and disconnect it from the Main



CAUTION: Before moving any jumper setting, switch off the equipment and disconnect it from Main.

BUZZER ON
 BUZZER OFF

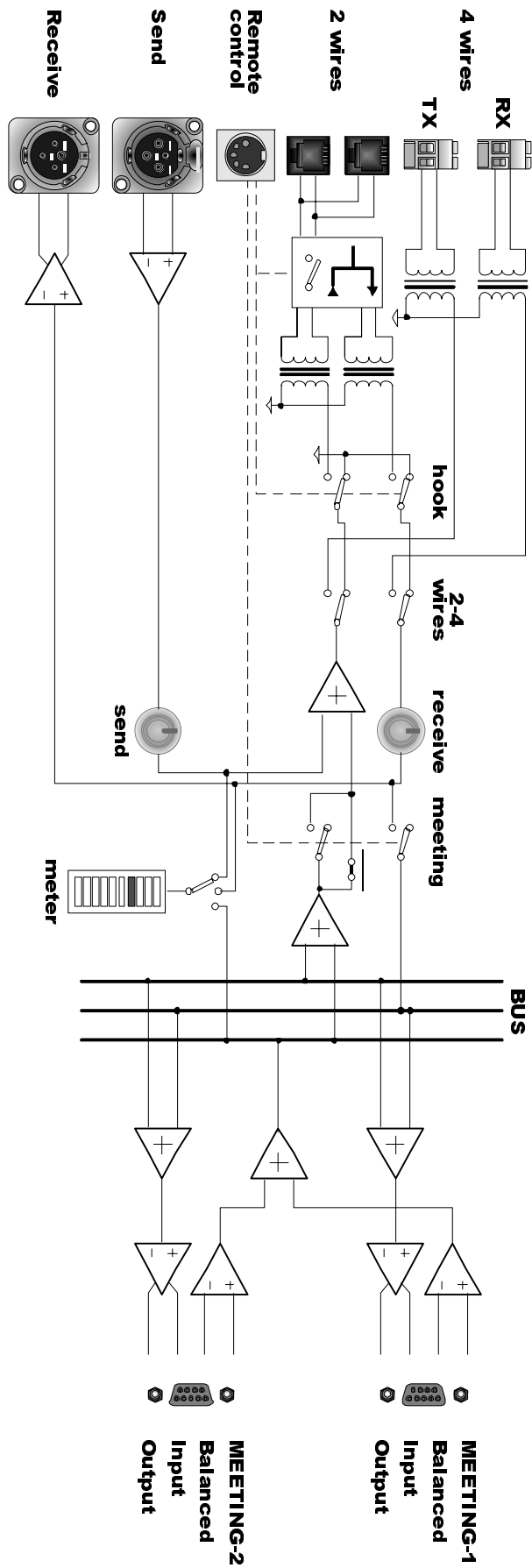


IMP. 10K
 IMP. 500

incoming meeting signal always enabled

 incoming meeting signal enabled by MT switch

15 BLOCK DIAGRAM



16 TECHNICAL SPECIFICATIONS

AUDIO PROGRAM IN / OUT	
Connectors	XLR, electr. balanced
Input impedance	600 Ohm / 10K Ohm (selectable)
Output level *	- inf to + 16 dBm
Output impedance	100 Ohm
Noise on Receive output	less than -80 dBm (DIN noise)
2 wires separation	less than 25 dB**
4 wires separation	less than 70 dB

2WIRE SECTION	
Connector	RJ11
Nominal input level	- 6 dBm
Nominal output level	- 6 dBm
Compensation mode	Electronic, transf. decoupled
Impedance	600 Ohm

GENERAL DATA	
Power Supply	220/110V 10VA
Dimension	434x351x44mm (1 rack unit)
Weight	about 4Kg

MEETING IN / OUT	
Connector	DB 9 female
Nominal in / out audio level	0 dBm
Input impedance	600 Ohm / 10K Ohm (selectable)
Output impedance	100 Ohm

4WIRE SECTION	
Connector	Terminal block
Impedance	600 Ohm
Nominal TX level	0 dBm
Nominal RX level	0 dBm

* nominal line level : - 6 dBm

** it can vary depending on characteristics of telephone line

All measurements are intended at 1 kHz.

17 WARRANTY

The manufacturer offers a 1-year ex works warranty.

Do not open the equipment. The warranty shall be voided if any of the warranty seals are broken.

The manufacturer shall not be liable for damage of any kind deriving from or in relation to incorrect use of the product.