



# Phone In 6 User Handbook



**SONIFEX**



This handbook is for use with the following products :

**Packages:**

- PI-6PSTN4 Phone In 6 system comprising 1 x PI-6C, 1 x PI-6R and 2 x PI-PSTN2
- PI-6PSTN6 Phone In 6 system comprising 1 x PI-6C, 1 x PI-6R and 3 x PI-PSTN2
- PI-6ISDN6 Phone In 6 system comprising 1 x PI-6C, 1 x PI-6R and 3 x PI-ISDN2

**Components:**

- PI-6C Phone In 6 Base Console
- PI-6R Phone In 6 Remote Control Panel
- PI-PSTN2 Phone In 6 PSTN Card
- PI-ISDN2 Phone In 6 ISDN Card

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## Warranty

### Warranty and Liability

**Important: the purchaser is advised to read this clause**

- (a) The Company agrees to repair or (at its discretion) replace Goods which are found to be defective (fair wear and tear excepted) and which are returned to the Company within 12 months of the date of despatch provided that each of the following are satisfied:
- (i) notification of any defect is given to the Company immediately upon its becoming apparent to the Purchaser;
  - (ii) the Goods have only been operated under normal operating conditions and have only been subject to normal use (and in particular the Goods must have been correctly connected and must not have been subject to high voltage or to ionising radiation and must not have been used contrary to the Company's technical recommendations);
  - (iii) the Goods are returned to the Company's premises at the Purchaser's expense;
  - (iv) any Goods or parts of Goods replaced shall become the property of the Company;
  - (v) no work whatsoever (other than normal and proper maintenance) has been carried out to the Goods or any part of the Goods without the Company's prior written consent;
  - (vi) the defect has not arisen from a design made, furnished or specified by the Purchaser;
  - (vii) the Goods have been assembled or incorporated into other goods only in accordance with any instructions issued by the Company;
  - (viii) the defect has not arisen from a design modified by the Purchaser;
  - (ix) the defect has not arisen from an item manufactured by a person other than the Company.

In respect of any item manufactured by a person other than the Company, the Purchaser shall only be entitled to the benefit of any warranty or guarantee provided by such manufacturer to the Company.

- (b) In respect of computer software supplied by the Company the Company does not warrant that the use of the software will be uninterrupted or error free.
- (c) The Company accepts liability:





- (i) for death or personal injury to the extent that it results from the negligence of the Company, its employees (whilst in the course of their employment) or its agents (in the course of the agency);
  - (ii) for any breach by the Company of any statutory undertaking as to title, quiet possession and freedom from encumbrance.
- (d) Subject to conditions (a) and (c) from the time of despatch of the Goods from the Company's premises the Purchaser shall be responsible for any defect in the Goods or loss, damage, nuisance or interference whatsoever consequential economic or otherwise or wastage of material resulting from or caused by or to the Goods. In particular the Company shall not be liable for any loss of profits or other economic losses. The Company accordingly excludes all liability for the same.
- (e) At the request and expense of the Purchaser the Company will test the Goods to ascertain performance levels and provide a report of the results of that test. The report will be accurate at the time of the test, to the best of the belief and knowledge of the Company, and the Company accepts no liability in respect of its accuracy beyond that set out in Condition (a).
- (f) Subject to Condition (e) no representation, condition, warranty or other term, express or implied (by statute or otherwise) is given by the Company that the Goods are of any particular quality or standard or will enable the Purchaser to attain any particular performance or result, or will be suitable for any particular purpose or use under specific conditions or will provide any particular capacity, notwithstanding that the requirement for such performance, result or capacity or that such particular purpose or conditions may have been known (or ought to have been known) to the Company, its employees or agents.
- (g) (i) To the extent that the Company is held legally liable to the Purchaser for any single breach of contract, tort, representation or other act or default, the Company's liability for the same shall not exceed the Price of the Goods.
- (ii) The restriction of liability in Condition (g)(i) shall not apply to any liability accepted by the Seller in Condition (c).
- (h) Where the Goods are sold under a consumer transaction (as defined by the Consumer Transactions (Restrictions on Statements) Order 1976) the statutory rights of the Purchaser are not affected by these Conditions of Sale.

### Unpacking the Phone In 6

The Phone In 6 is shipped with the following equipment. Please check your packaging to ensure that you have all of the items below. If anything is missing, please contact the supplier of your equipment immediately.

Item	Quantity Phone In 6 PI-6PSTN4	Quantity Phone In 6 PI-6PSTN6	Quantity Phone In 6 PI-6ISDN6
PI-6C Base Console	1	1	1
PI-6R Remote Control Panel	1	1	1
PI-PSTN2 PSTN 2 Channel Module	2	3	-
PI-ISDN2 ISDN 2 Channel Module	-	-	3
IEC Mains lead	2	2	2
Handbook and warranty card	1	1	1
Headset	1	1	1

Table A : Packing List.

Each Phone In 6 is shipped in protective packaging and should be inspected for damage before use. Where an item is found to have transit damage, notify the carrier immediately with all the relevant details of the shipment. Packing materials should be kept for inspection and also for if the product needs to be returned.

### Returning the Warranty Card

In order to register the date of purchase so that we can keep you informed of any design improvements or modifications, it is important to complete the warranty registration document that is enclosed and return it to Sonifex Ltd in the UK, or register online at [www.sonifex.co.uk/register](http://www.sonifex.co.uk/register)

For your own records you should write down the serial number (which can be found on the rear of the Phone In 6 or on the connector on the Phone In 6).

Serial Number	.....
---------------	-------



## Safety Information

### Safety of Mains Operated Equipment



This equipment has been designed to meet the safety regulations currently advised in the country of purchase and it conforms to the safety regulations specified by use of the CE Mark.

**Warning :** There are no user serviceable parts inside the equipment. If you should ever need to look inside the unit, always disconnect the mains supply before removing the equipment covers.

**Warning:** In the UK the Phone In 6 phone line socket should only be connected with apparatus complying with BS6301, and the connection to the network must not be hard wired Interconnection directly or indirectly with equipment ports marked in accordance with BS6301 to unmarked ports may produce hazardous conditions on the network and advice should be obtained from a competent engineer before such a connection is made.

**Warning:** This apparatus must be earthed by means of the earth connector on the rear panel, and the connection to the telecommunications network should be removed before disconnecting the earth. Disconnection of this earth connection may render the equipment unsafe, with a consequential possible electrical shock hazard from exposed metallic parts.

**Warning:** The barriered ports 'PSTN' and 'ISDN' must not be connected directly or indirectly to the un-barriered ports, 'MUSIC ON HOLD', 'HYBRID 1/2 INPUT/OUTPUT', 'REMOTE GPI/O' or 'RS-232'.

### Voltage Setting Checks

The integral power supply is designed to accept a universal input of 85 to 264 VAC mains input voltage. The safety specification of your Phone In 6 complies with local requirements and must be earthed through the mains connector.

### Fuse Rating

The Phone In 6 is supplied with a single fuse in the live conducting path of the mains power input. For reasons of safety it is important that the correct rating and type of fuse is used. Incorrectly rated fuses could present a possible fire hazard, under equipment fault conditions. The fuse rating for Phone In 6 is:

85V - 264V AC operation - 1A 5 x 20mm SB

The active fuse is fitted on the outside rear panel of the unit.



### Power Cable and Connection

An IEC power connector is supplied with the Phone In 6 which has a moulded plug attached – this is a legal requirement. If no moulded plug has been supplied with your Phone In 6, please contact your supplier, because an IEC connector is always supplied from the Sonifex factory.

If for any reason, you need to use the Phone In 6 with a different power cable, you should use the following wiring guidelines

Wire Colour	Connection
Green, or green and yellow	Earth (E)
Blue, or Black	Neutral (N)
Brown, or Red	Live (L)

Table B: Power Connections.

Connect the equipment in accordance with the connection details and before applying power to the unit, check that the machine has the correct operating voltage for your mains power supply.

**Important Note : The terminal marked on the rear panel must be earthed.**



**Ordering the Correct Mains Lead**

When ordering a TBU from Sonifex, it is helpful if you can specify your required operating voltage and mains lead. After the product code add:

UK, for 230V, UK 3 pin to IEC lead



EC, for 230V, European Schuko 2 pin to IEC lead



US, for 115V, 3 pin to IEC lead



AU for 230V, Australasian 3 pin to IEC lead



Table C: Mains Lead Table.

E.g. order PI-6PSTN4 UK for a UK IEC lead to be supplied.

**Installation Information****Atmosphere**

The units should be installed in an area that is not subject to excessive temperature variation ( $<0^{\circ}\text{C}$ ,  $>50^{\circ}\text{C}$ ), moisture, dust or vibration.

**Electromagnetic Radiation**

The cover is connected to earth by means of the fixing screws. It is essential to maintain this earth ground connection to ensure a safe operating environment and provide electromagnetic shielding.



### WEEE & RoHS Directives - Sonifex Statement



The Waste Electrical and Electronic Equipment (WEEE) Directive was agreed on 13 February 2003, along with the related Directive 2002/95/EC on Restrictions of the use of certain Hazardous Substances in electrical and electronic equipment (RoHS).

The **Waste Electrical and Electronic Equipment Directive (WEEE)** aims to minimise the impacts of electrical and electronic equipment on the environment during their life times and when they become waste. It applies to a huge spectrum of products. It encourages and sets criteria for the collection, treatment, recycling and recovery of waste electrical and electronic equipment. All products manufactured by Sonifex Ltd have the WEEE directive label placed on the case. It gives a contact for individuals who are unsure about the correct procedure when the product has reached its "end of use".

Sonifex Ltd will be happy to give you information about local organisations that can reprocess the products, or alternatively all products that have reached "end of use" can be returned to Sonifex and will be reprocessed correctly free of charge.

Sonifex Ltd has phased out the use of certain hazardous substances identified in the European Union's **Restriction of Hazardous Substances (RoHS)** directive. The RoHS directive limits the use of certain hazardous substances currently used in EEE manufacture, including lead, mercury, cadmium, hexavalent chromium, and halide-containing compounds PBB (polybrominated biphenyl) and PBDE (polybrominated diphenyl ether). Elimination of these substances will result in more environmentally friendly recycling of electronic equipment. For the products which Sonifex manufacture, the main area where products were affected was in the use of lead for manufacturing and assembling electronics circuit boards.

Sonifex Ltd practices lead-free (LF) manufacturing processes. LF solder is used on the surface-mount PCB manufacturing processes and for hand soldering. The printed circuit boards (PCBs) used are either gold plated, or immersion tin plated, both of which use no lead. Historically the PCBs were hot air solder levelled (HASL) PCBs which used tin/lead based solder.

The manufacturing processes include the assembly of purchased components from various sources. Product is offered as RoHS compliant, or LF, only after sufficient evidence is received from the component manufacturers that their components are RoHS compliant. Sonifex Ltd relies solely on the distributor, or manufacturer, of the components for identification of RoHS compliance. Thus whilst every effort is made to ensure compliance, Sonifex Ltd makes no warranty, or certification, or declaration of compliance concerning said components.

Sonifex Ltd defines "Lead Free" as pertaining to any product, which has been manufactured by Sonifex Ltd using components which have been declared by the manufacturers as "Lead Free". All statements by Sonifex Ltd of RoHS compliance are based on component manufacturer documentation.





## Reporting Faults

Although this Sonifex product is manufactured to the highest standards, it is possible that minor faults may appear in the equipment over its normal lifetime. If you find any problems with the Phone In 6, please contact your Sonifex distributor, or contact Sonifex directly at the following address, or fax with a copy of this completed sheet :

To :	From:
Sonifex Ltd,	Name
61, Station Road,	Position
Irthlingborough,	Company
Northants.	Address
NN9 5QE, UK	
Tel : +44 (0)1933 650 700	Tel
Fax : +44 (0)1933 650 726	Fax
Email : technical.support@sonifex.co.uk	Email

For the Serial No. of your machine, see the back panel of the Phone In 6 units.

Phone In 6 Serial No.	
PI-6C	
PI-6R	

Please describe the error in as much detail as possible (for example what you were doing when the problem occurred, what actually happened, etc)

Description of Phone In 6 Error

Also, if you have any suggestions for additions or upgrades to the Phone In 6 unit , we would like to hear what they are :

Additions that I Would Like to See

## Phone In 6 Introduction



The Phone In 6 is a call control centre for phone-in radio shows. It is capable of interfacing to 2, 4, or 6 phone lines by fitting up to 3 modules, where each module can have 2 x PSTN lines or 1 x ISDN BRI line. The ISDN basic rate interface allows 2 calls to be handled, 1 on each B channel. The PSTN module has 2 interfaces each using a modern digital hybrid interface, which is settable by software to handle a variety of PSTN and PABX systems with varying impedances, call connection & disconnection tones.

The unit comprises 2 boxes: The PI-6C 1U rack mounted Base Console (BC) unit which has all the audio & telephony connections together with the metering and complex controls.

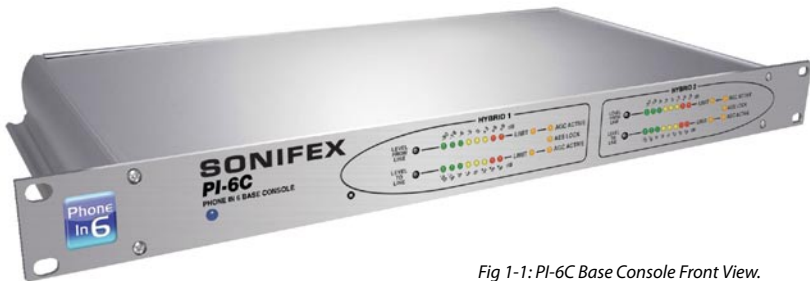


Fig 1-1: PI-6C Base Console Front View.

Secondly, there is the PI-6R Remote Control Panel (RCP) which connects via Ethernet based cabling to the main unit and allows the user to see the status of each caller, to receive an incoming call and to subsequently route it to the mixing desk. It also includes connectors for a headset that enable remote dialling out and the screening of incoming calls.



Fig 1-2: PI-6R Remote Control  
Panel Front View

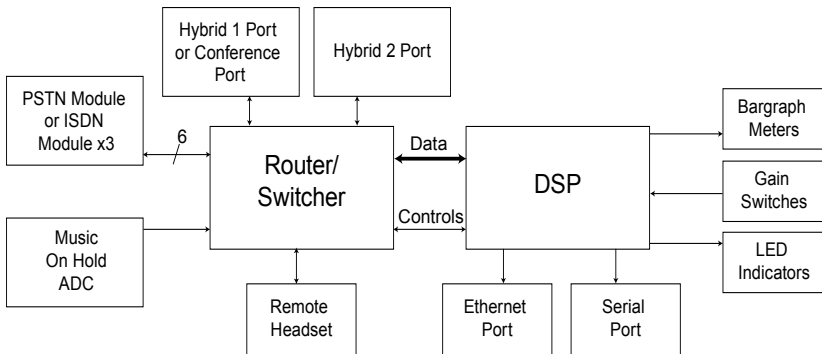


The Base Console has 3 module positions on the rear panel into which either of the PI-PSTN2 (2 x analogue telephone lines) or PI-ISDN2 (2 x ISDN B channels) modules can be fitted. The Base Console is capable of connecting internal DSP and hybrid circuits to any 2 lines and routing these out to a studio mixing desk.

The Phone In 6 uses an echo-cancellation DSP (digital signal processing) algorithm and impedance matching to give around 70dB cancellation, which provides excellent separation of caller & line send audio and elimination of feedback, distortion & echo on the incoming calls. This is close to being the best performance possible on a telephone line & uses the same enhanced echo cancellation algorithms as used on the DHY-03 telephone hybrid, the best performing telephone hybrid in the world. The DSP, which uses 24bit variables and at least 48bit math algorithms, can also monitor the call progress tones for various disconnection arrangements. The audio data is supplied to the DSP from analogue inputs via 24bit ADCs.

### System Diagram

#### PI-6C Base Console



#### PI-6R Remote Control Panel

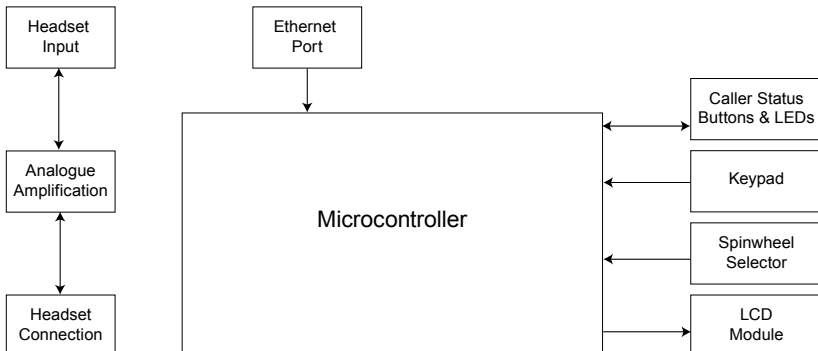


Fig 1-3: System Block Diagrams

## Phone In 6 Operation

The Base Console is connected to the incoming lines; to a music-on-hold source; to 1 or 2 channels on a mixing desk and to the Remote Control Panel. The Base Console accepts an incoming call and indicates the ring to the Remote Control Panel. The call is either automatically answered by the unit and supplied with music-on-hold, or is answered manually by the user. The user has the following options:

- Send the caller to the mixing desk by assigning it to an on-air channel.
- Place the caller on-hold and send them the music-on-hold signal .
- Drop the call.

During the initial call control there is limited processing being performed by the unit, but once the call is assigned to an on-air channel, the audio is passed through to the DSP to provide the highest quality possible for the station output.

### DSP Features Of The Phone In 6 System

- Echo-cancellation which cleans the telephone signal to remove any echoes from the analogue portions of the call and ensures that the mixing desk is only sent the caller audio.
- AGC (automatic gain control) & a Noise Gate which sets the level of the caller audio to a suitable level for the mixing desk and also reduces the noise floor when the caller is silent.
- Ducking so when both caller and presenter are talking together the DSP can automatically reduce the level of the caller so that the presenter is always able to talk over the caller, e.g. to gracefully end a heated call;
- In conference mode the DSP mixes the other caller audio into the sent signal so that each caller can hear the station output and the other caller in the conference call.

### Conferencing Calls & Use of the Cleanfeed/Mix-Minus

The Phone In 6 handles 2 live calls at once and normally each call is connected to a separate telco channel on a mixing desk. Each channel receives the caller audio and allows the presenter to talk to the caller off-air (usually via the pre fade listen (PFL) or Cue selection on the mixer), or to place the caller to air. In both cases the mixing desk outputs audio back to the caller via the Phone In 6 unit – this is usually the signal from the presenter’s microphone or a special mix of the station output.

The unit is configured in 2 ways:

**Normal Mode** where 2 calls can be handled independently, each with its own caller output and cleanfeed input.

**Conference Mode** where up to 2 calls are mixed within the unit and are presented as a single audio stream on the output with a single cleanfeed input.

The cleanfeed, also known as mix-minus, is a specific mix from the desk/mixer that contains all of the radio station output except for the caller himself or herself. In Conference Mode the unit provides a mix of both callers and the cleanfeed is a mix without either caller. The unit mixes in the other caller for each signal sent out to the callers.





In Normal Mode the unit should be connected to 2 telco channels that each generate their own cleanfeed output. If the mixing desk is able to generate a cleanfeed without either caller from the 2 independent caller outputs, then the unit can accept a single input and add in the other caller for the appropriate caller output the same as is performed in Conference Mode – this is known as Shared Mode.

### Call Handling - Self-op & Call Screening Modes

The Phone In 6 allows radio shows to be organised in 2 main ways:

- Self-op where the show is entirely controlled by the presenter.
- Call-screening where an assistant or producer deals with incoming calls manually and then places the calls to the presenter via the on-air selections.

#### Self-op Mode

In Self-op Mode the unit can automatically answer calls and place them in a queue where they are supplied with the music on hold signal. When the presenter is ready, they can accept the next caller to air. The queuing system can be set to use 1 or 2 hybrid channels, though if the mixing desk has only one telco module available we advise that you do not use conferencing and queue to a single channel only. If 2 channels are available and you configure it to use only 1 hybrid for the queue, then the second channel is available for manual intervention, for example to save a call when the presenter needs further caller details as a prize winner, or to make outgoing calls.

#### Auto-Answer & Auto-Drop Calls

Calls are auto-answered and by designating one of the GPIO remote input ports to receive a 'drop call' command when the channel is switched off, the call is dropped once the conversation with the presenter has finished. The calls can be shuffled up so that line 1 is designated as the on-air 1 caller, then on-air 2, then unanswered calls in their queue order. Or the ON-AIR 1 and ON-AIR 2 (if used) buttons show the current calls to the mixing desk and the next call flashes its LINE HOLD button yellow.

#### Call Screening Mode

In Call-screening Mode an assistant/producer can answer calls and then the caller can be put on-hold and supplied with the Music On Hold signal until the presenter is ready to take the call. The call-screener communicates to the presenter by the normal talkback interface on the mixing desk. The procedure to manually handle calls is described below

#### Receiving a Call

When the unit receives a call, the LINE HOLD button flashes red for that line. The call handler should press the button to accept the call, which stops the flashing, illuminating the button green and routes it to the Music On Hold signal.

If the call handler is ready to talk to the caller straight away, then pressing the LOCAL button followed by the LINE HOLD button accepts the call, lights both buttons yellow and routes it to the call handler's headset. The call can then be put on hold by pressing the LOCAL button again, which clears the LOCAL button and makes the LINE HOLD button go green.

### Routing a Call

To route a call to the mixing desk, press the ON-AIR button associated with that line. The ON-AIR button illuminates green and the audio to and from the caller is routed through the DSP hybrid and to/from the mixing desk. The unit can be programmed to send a signal to the mixing desk from the GPIO port to allow the telco channel on the mixer to indicate that a call is present.

If the hybrid is already in use, or the unit is in conference mode and 2 calls are already being handled, then the ON-AIR button flashes red briefly and returns to the off state. To remove a call from the hybrid press & hold the ON-AIR button for a second and the caller is returned to the Music On Hold state

### Dropping a Call

To drop a call, simply press & hold the LINE HOLD button for a second and the call is dropped.

### Making a Call

To make a call press the LOCAL button followed by an unused line's LINE HOLD button. The headset is now connected to the line and the call handler should hear the dial tone. Use the keyboard to direct dial a call using DTMF dialling or use the hash (#) key to use the phonebook entries or ## to repeat the last used number.

## Phone In 6 Configuration

The Phone In 6 comprises 2 units, a Base Console (BC) and a Remote Control Panel (RCP) communicating through a TCP/IP network. The units each need a TCP/IP address to communicate and also need to be paired to work together. The configuration is performed entirely at the RCP where the TCP/IP address is set in static mode or set to use a local DHCP server. The RCP can then search for base units attached to the system. It may find a number of connected BC devices and the serial number and state of each unit's connectivity is indicated. Choose the appropriate BC and designate it as the pair for the RCP. This unit can then also be configured for its TCP/IP address.

The system can then be set up to operate in the manner required using the menu system on the RCP. Some of the setup is specific to the actual install, e.g. country type for the hybrid settings, ring cadences & disconnect tones supplied by the network provider. Other settings can be program specific, e.g. call screening/self-op mode. The latter settings can change with the presenter, or as a particular show changes, so multiple sets of these parameters can be saved into permanent memory within the system which the user can easily store and change by using the \* key and a single digit number to update those parameters.

The RCP has the ability to make calls to unused lines and there is a Phonebook that allows the user to create 99 preset numbers which are easily accessed by using the # key followed by the 2 digit number. Also a double # key calls the last dialled number.



### Phone In 6 Menus

All of the parameters are accessed via the Remote Control Panel menu options. Simply press and hold the rotary spinwheel to enter the menus. Use the spinwheel to move along the menu selections, or to change the value of a parameter and just press the spinwheel to accept the option. Pressing & holding the spinwheel button exits the menu system.

Figures 1-4 shows the menu options available, but not all options are accessible for each system (e.g. no ISDN options are displayed for systems supplied without ISDN modules fitted).

The menu is self explanatory, allowing access to all of the possible options available on the system.

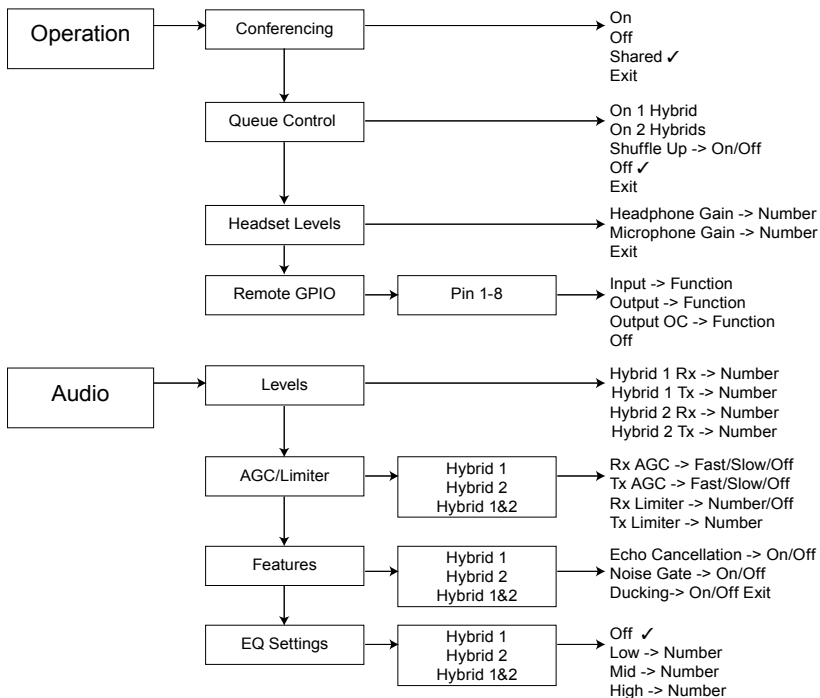


Fig 2-1a: Menu Structure Part 1

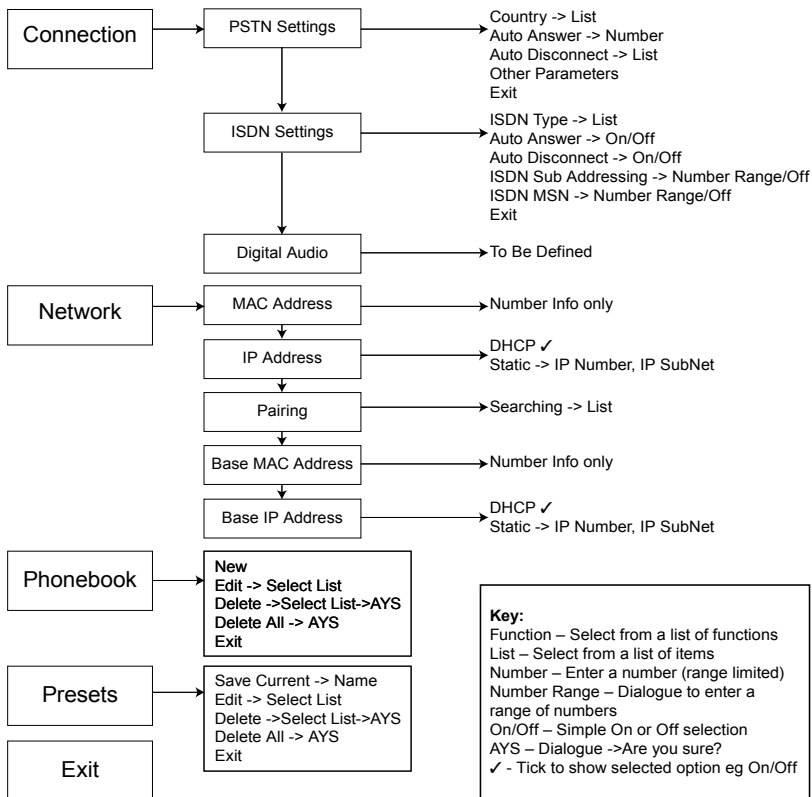


Fig 2-1b: Menu Structure Part 2



### Phone In 6 Base Console Front Panel Controls & Indicators

The Phone In 6 Base Console is a 1U rackmount unit to which the audio & telephone connections are made & which houses the two digital telephone hybrids.

The level of the caller outputs and mix-minus send are displayed on four 8-digit bargraphs. Each has 2 associated LEDs for AGC (automatic gain control) and Limiter operation. AGC is applied to the levels to ensure operation in a normal range, but further fixed gain can be applied by front panel switches. The signal level sent to the telephone line is regulated by telecom providers and the unit at all times controls the call level to maintain the signals to their legal limits.

The front panel also has a blue power indicator LED and a recessed reset button.



Fig 3-1: Base Console Front Panel

#### Meters

The meters indicate the levels for both send & receive signals between the hybrid and the line. For proper operation the 0dB LED should be illuminated most of the time that normal audio is present, with occasional peaks just illuminating the +6dB LED (first red LED). The signal is a pseudo-PPM meter which shares the characteristics of the PPM dynamics, but is tuned for the telephone environment. The meters are equi-spaced in the working zone (-6 to +9dB) but to extend the scale for low-level signals the lowest 2 LEDs are spaced on 12dB intervals. The unit can work in this range if required but the noise floor may be excessive (due to the nature of telephone lines) and consequently the performance of the hybrid may be compromised.

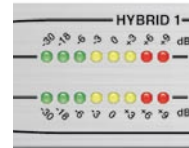


Fig 3-2: Meters

#### Gain Controls

Gain controls are provided for both send & receive levels on each hybrid and allow adjustment of the audio gain in 6dB steps from 0 to +12dB. Changes in the gain switches are reflected in the meters.

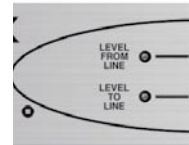


Fig 3-3: Gain Controls

#### LED Indicators

LED Indicators are provided for both send & receive levels on each hybrid and show the active state of internal gain controls within the DSP. When the digital audio build option is selected (i.e. AES/EBU inputs and outputs), the panel also shows the lock state of the incoming digital audio signals.



Fig 3-4: Gain Controls

## Base Console Rear Panel

The Phone In 6 has an IEC mains inlet with 2A fuse, 1 x XLR Music On Hold input, 2 x XLR audio inputs, 2 x XLR caller audio outputs and 1 x RJ-45 remote headset audio port. The unit has up to 3 option modules with either an ISDN connector or a dual RJ11 1-4/6 telephone connector, each providing 2 lines of telephone connectivity. It also has a RJ-45 Ethernet port, a 9 pin GPIO connector and a RS232 9 pin D type serial control port.



Fig 3-5: Base Console Rear Panel

## Telephone Interface Modules

The Phone In 6 can accept up to 3 modules, each with the capability to interface to 2 telephone lines. The PI-PSTN2 module can connect to 2 analogue telephone lines or 2 analogue PABX connections. The PI-ISDN2 module can connect to an ISDN Basic Rate ISDN line or to an S0 port from a PABX.

## Base Console Rear Inputs & Outputs

### Music On Hold Input

This analogue audio input provides a feed for callers when they are not connected to the mixing desk or headset. The connector is a single balanced XLR socket with the following connections:

- Pin 1 : Screen
- Pin 2 : Phase
- Pin 3 : Non-phase



Fig 3-6: Music on Hold Input

### Hybrid 1 (Conference) Input

The Hybrid 1 Input is an analogue input which takes a mix-minus or cleanfeed from your mixer into hybrid 1 in the Base Console. This input also acts as the Conference Input when the unit is in Conference Mode. When the Base Console is fitted with optional AES/EBU I/O, this connector acts as digital audio input 1 (see Digital Audio Option later for more information). The connector is a single balanced XLR socket with the following pin connections:

- Pin 1 : Screen
- Pin 2 : Phase
- Pin 3 : Non-phase



Fig 3-7: Hybrid 1 (Conference) Input



### Hybrid 1 (Conference) Output

The Hybrid 1 Output is an analogue output providing the caller audio to your mixing desk and acts as the Conference Output when in Conference Mode. When the Base Console is fitted with optional AES/EBU I/O, this connector acts as digital audio output 1 (see Digital Audio Option later for more information). The XLR output has the following connections:

- Pin 1: Screen
- Pin 2: Phase
- Pin 3: Non-phase

### Hybrid 2 Input

The Hybrid 2 Input is an analogue input which takes a mix-minus or cleanfeed from your mixer into hybrid 2 in the Base Console. When the Base Console is fitted with optional AES/EBU I/O, this connector acts as digital audio input 2 (see Digital Audio Option later for more information). The connector is a single balanced XLR socket with the following pin connections:

- Pin 1 : Screen
- Pin 2 : Phase
- Pin 3 : Non-phase

### Hybrid 2 Output

The Hybrid 2 Output is an analogue output providing the caller audio to your mixing desk. When the Base Console is fitted with optional AES/EBU I/O, this connector acts as digital audio output 2 (see Digital Audio Option later for more information). The XLR output has the following connections:

- Pin 1: Screen
- Pin 2: Phase
- Pin 3: Non-phase

### Link To Remote Panel

This 8-way RJ45 socket is used to connect the Base Console to the Remote Control Panel. The cable between them carries the analogue balanced line level send and receive audio from and to the headset connected to the Remote Control Panel. You can use a standard CAT5 cable to link the two units together. The pin assignments are as follows:

- Pin 1: INPUT: From headset mic, phase
  - Pin 2: INPUT: From headset mic, non-phase
  - Pin 3: OUTPUT: To headset earphone, phase
  - Pin 4: Ground
  - Pin 6: OUTPUT: To headset earphone, non-phase
- All other pins are unused.



Fig 3-8: Hybrid 1 Output



Fig 3-9: Hybrid 2 Input



Fig 3-10: Hybrid 2 Output

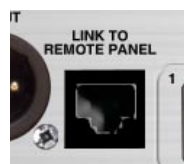


Fig 3-11: Link To Remote Panel

### PSTN 1,2 & 3 Telephone Line Connectors

These 4-way RJ116/4 sockets provide the connection between your telephone system/lines and the Phone In 6 system. They are analogue telephone ports, connected via Pins 3 and 4 on the RJ11 (and Pins 2 and 5 on any converted BT Plug).

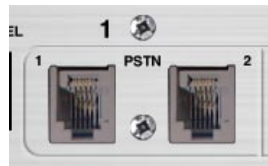


Fig 3-12: PSTN Connectors

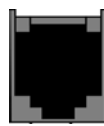
#### RJ11 Telephone Connections

Pin 1 : N/C  
Pin 2 : N/C  
Pin 3 : Telephone line A  
Pin 4 : Telephone line B  
Pin 5 : N/C  
Pin 6 : N/C

#### BT Telephone Connections

Pin 1 : N/C  
Pin 2 : Telephone line A  
Pin 3 : Ringing  
Pin 4 : Connected for neatness only  
Pin 5 : Telephone line B  
Pin 6 : N/C

Pin 1 Pin 6



RJ11 Socket

BT Plug



### Ethernet Port

The 8-way RJ45 socket connector carries a standard Ethernet interface and allows connection to a local area network. The pin assignments are as follows:

Pin 1: Transmit data+	WHITE/Orange
Pin 2: Transmit data-	ORANGE/White
Pin 3: Receive data+	WHITE/Green
Pin 4: None	BLUE/White
Pin 5: None	WHITE/Blue
Pin 6: Receive data-	GREEN/White
Pin 7: None	WHITE/Brown
Pin 8: None	BROWN/White



Fig 3-13: Ethernet Port

### RS232 Serial port

The serial port allows direct connection to a PC via a 9 way 'D' type socket. The pin connections are:

Pin 1: N/C  
Pin 2: TxD  
Pin 3: RxD  
Pin 4: N/  
Pin 5: Ground  
Pin 6: N/C  
Pin 7: CTS  
Pin 8: RTS  
Pin 9: N/C



Fig 3-14: RS232 Serial Port



### Remote GPIO/O

The remote connector is a 9-way female socket 'D' type. The GPIO connector provides for 8 general-purpose inputs or outputs. The function of these pins is defined from the system menu and allows the system to communicate to a mixing desk to ensure that the presenter is aware of the state of the calls on the Telco channels and to allow the system to automatically handle the calls in self-op mode.

The remotes are freely programmable using the menu structure, with the following pin connections.

- Pin 1: GPIO 1
- Pin 2: GPIO 2
- Pin 3: GPIO 3
- Pin 4: GPIO 4
- Pin 5: Ground
- Pin 6: GPIO 5
- Pin 7: GPIO 6
- Pin 8: GPIO 7
- Pin 9: GPIO 8

### IEC Mains Input

The power supply is connected via an IEC Connector (CEE22) 85 - 264VAC, 47-63Hz, 10W average.

### Digital Audio Option

Audio inputs and outputs can be supplied as a build option. They use common connectors to those used for the analogue ports, but the digital port is by definition a stereo interface. The left right pairs are defined to operate in mono mode (i.e. left = right for the output and left or right can be chosen as the input signal). The digital input accepts valid AES/EBU signals from 32 to 96 kHz sampling rates and the outputs are synchronised to the incoming signal. All digital signals, both inputs and outputs, are sample rate converted so that they use the internal clocks suitable for telephone bandwidth.

### Audio Clocking

When PI-ISDN2 modules are used, the internal audio clocks are synchronous to the ISDN master clock, which is derived from the Module in slot 1. If no ISDN modules are fitted, then the internal clock is generated onboard from a stable crystal oscillator.



Fig 3-15: Remote GPIO/O Port

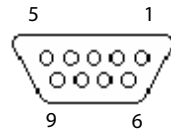


Fig 3-16: Remote GPIO/O Pins viewed from rear of plug (or front of socket on unit)



Fig 3-17: IEC Mains Connector

## Remote Control Panel Controls & Indicators

The Remote Control Panel has a headset port, and 6 sets of 3 illuminated buttons for call control and status indication. The console also has a 2-line LCD screen with rotary spinwheel with push switch driven menu interface and a 12 digit keypad for direct dial of numbers. By using the hash key as a prefix the user can access 99 saved numbers, or by using the star key as a prefix 9 different user configurations can be recalled (which can be password protected). The Remote Control Panel is connected to the base unit using an RJ45 Ethernet port and an RJ45 to carry the headset audio.



Fig 4-1: Remote Control Panel Front

### Spinwheel Control & LCD Display

Use the black spinwheel to control volume levels and navigate the setup menu on the 2 line LCD display. Push and hold the control to enter the menu, then click it to make selections within the menu. The display shows system settings as well as call information.

### Numeric Keypad

The 12-digit numeric keypad is used for dialling or preset selection. By using the hash key as a prefix the user can access 99 saved numbers, or by using the star key as a prefix 9 different user configurations can be recalled (which can be password protected).



Fig 4-2: Spinwheel



Fig 4-3: Numeric Keypad



### LOCAL Button

This is used to connect and disconnect a caller to the headset or to make a call on a free line, i.e. to use the headset to speak to caller's, have the LOCAL button selected. The button has a latching operation.



Fig 4-4: LOCAL Button

**The following three buttons are replicated for up to 6 telephone lines, numbered 1 - 6 along the top of the buttons:**

### LINE HOLD/Release Button

The LINE HOLD/Release button is used to control the line hold circuit, it illuminates to indicate the status of the line and flashes to show ring status.



Fig 4-5: LINE HOLD/Release Button

### ON AIR Button Hybrid 1

The ON AIR 1 button is used to route the caller to air on hybrid 1. The indicator in the button illuminates to show that the caller is on air. In Conference Mode, two callers can be put to air on Hybrid 1.



Fig 4-6: ON AIR 1 Button

### ON AIR Button Hybrid 2

The ON AIR 2 button is used to route the caller to air on hybrid 2. The indicator in the button illuminates to show that the caller is on air. In Conference Mode the On Air 2 button has no function.



Fig 4-7: ON AIR 2 Button

## Remote Control Panel Rear Panel Controls & Indicators



Fig 4-8: Remote Control Panel Rear

### Reset Button

This is a small recessed button between the headset sockets on the rear panel. If your Remote Control Panel should ever lock up, try resetting the unit, or reapplying power.



Fig 4-9: Recessed Reset Button

### LCD Contrast Adjustment

This is a recessed preset potentiometer which can be adjusted to change the contrast of the 2 line LCD display. Use a small flat-blade screwdriver to adjust this potentiometer.



Fig 4-10: LCD Contrast Adjustment



## Remote Control Panel Rear Inputs & Outputs

### Local Headset

There are 2 x 3.5mm jack sockets provided for connecting a local headset (separate microphone input and headphones output) for answering and making calls. The headset is usually used in Call Screening Mode. The headset signals are balanced electronically in the RCP and passed to the BC via the 'LINK TO BASE CONSOLE' connector.



Fig 4-11: Local Headset

### Link To Base Console

This 8-way RJ45 socket is used to connect the Remote Control Panel to the Base Console. The cable between them carries the analogue balanced line level send and receive audio from and to the local headset. You can use a standard CAT5 cable to link the two units together. The pin assignments are as follows:

- Pin 1: OUTPUT: Sending headset mic signal, phase
  - Pin 2: OUTPUT: Sending headset mic signal, non-phase
  - Pin 3: INPUT: Receiving headset earphone signal, phase
  - Pin 4: Ground
  - Pin 6: INPUT: Receiving headset earphone signal, non-phase
- All other pins are unused.



Fig 4-12: Link To Base Console

### Ethernet Port

The 8-way RJ45 socket connector carries a standard Ethernet interface and allows connection to a local area network. The pin assignments are as follows:

Pin 1: Transmit data+	WHITE/Orange
Pin 2: Transmit data-	ORANGE/White
Pin 3: Receive data+	WHITE/Green
Pin 4: None	BLUE/White
Pin 5: None	WHITE/Blue
Pin 6: Receive data-	GREEN/White
Pin 7: None	WHITE/Brown
Pin 8: None	BROWN/White

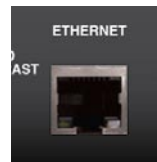


Fig 4-13: Ethernet Port

### IEC Mains Input

The power supply is connected via an IEC Connector (CEE22) 85 - 264VAC, 47-63Hz, 10W average.



Fig 4-14: IEC Power Connector

## Technical Specification

### Product Dimensions

#### Base Console Dimensions (mm)

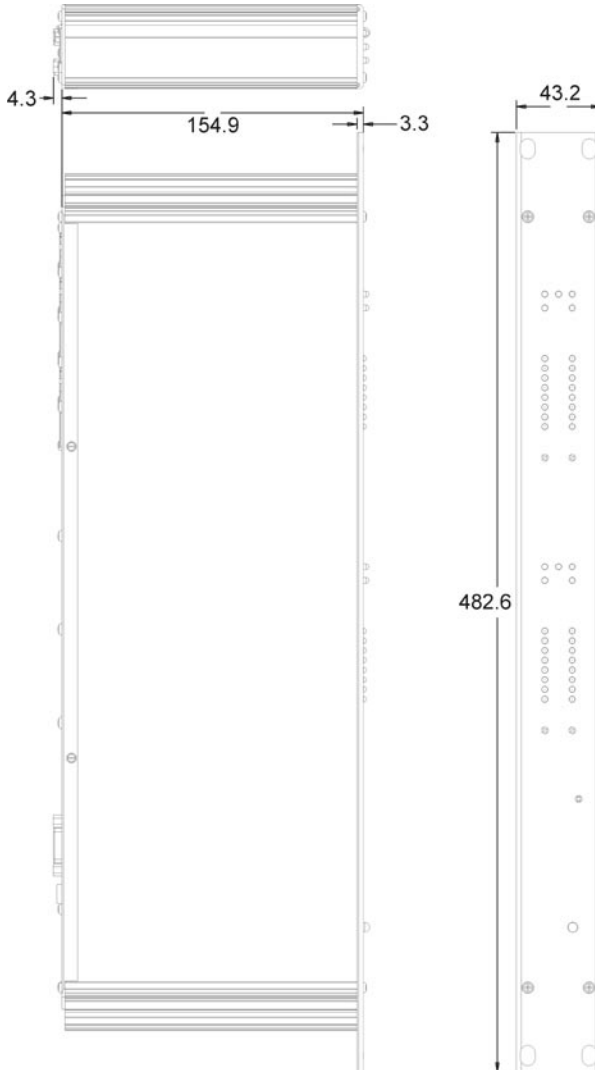


Fig 5-1: Base Console Dimensions



TECHNICAL SPECIFICATION

## Remote Control Panel Dimensions (mm)

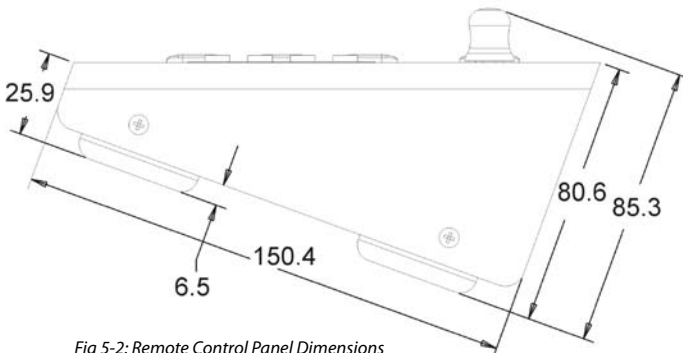
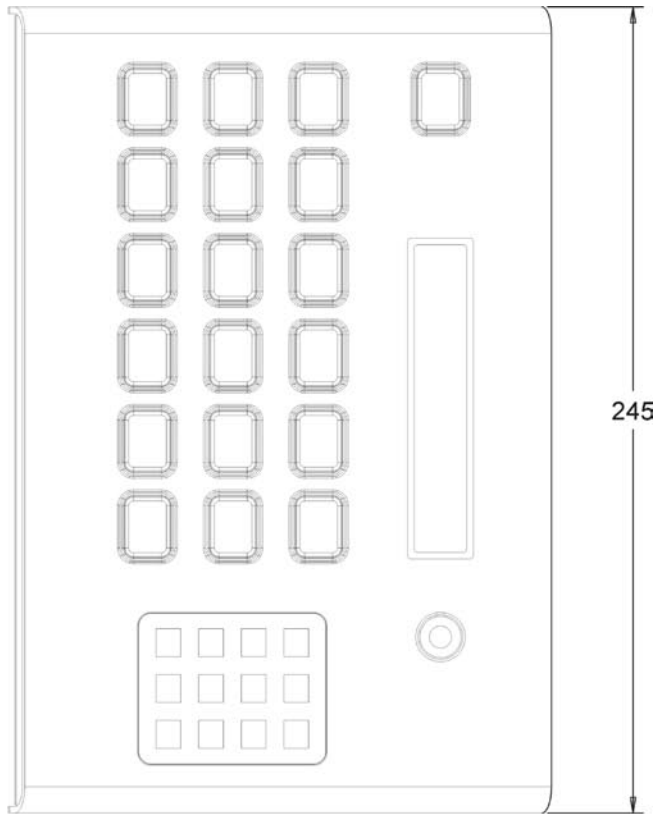


Fig 5-2: Remote Control Panel Dimensions

## Technical Specification

### Audio Inputs

Input Impedance – Line Mode >10k $\Omega$  balanced 0dB, optimum working input  
(Mix-minus audio to caller):

Input Level Range:	Adjustable 0 to +12dBu
ADC Signal to Noise:	Better than –89dbFS (RMS A-weighted at 24bit)
ADC Dynamic Range:	>96dB
ADC Distortion & Noise:	>87dB THD + N at 1kHz
ADC Frequency Response:	20Hz to 3.8kHz
Optional Digital Audio:	AES/EBU 110 $\Omega$ balanced inputs (IEC60968)
Sample Rates:	32kHz to 96kHz
0dBFS Reference Level:	12dBu or 18dBu

### Audio Outputs

Output Impedance <50 $\Omega$  balanced floating 0dB, optimum working input  
(Received audio from caller):

Output Level Range:	Adjustable -6 to +6dBu
DAC Signal to Noise:	Better than –85dbFS (RMS A-weighted at 24bit)
DAC Dynamic Range:	>97dB
DAC Distortion & Noise:	>83dB THD + N at 1kHz
DAC Frequency Response:	20Hz to 3.8kHz
Optional Digital Audio:	AES/EBU 110 $\Omega$ balanced outputs (IEC60968)
Sample Rates:	32kHz to 96kHz
0dBFS Reference Level:	12dBu or 18dBu

### PSTN Telephone Connection

Send to Line Limiting Input:	+4dBu
Bandwidth to Telephone Line:	125Hz – 3.8kHz, -3dB ref 1kHz
Telephone Line Impedance:	Nominally 600 $\Omega$ - complex impedances set via country code
Telephone Line Impedance Range:	300 $\Omega$ to 1500 $\Omega$
Telephone Rejection:	78dB on 1kHz tone, typically 75dB on complex waveforms, reference peak level of 0dB
Ring Detector Sensitivity:	1 ring to 8 rings

### ISDN Telephone Connection

ISDN Interface:	S0 (BRI) / I.430
D Channel Protocol:	DSS1, National 1, 5ESS, JATE (INS64), AUSTEL, X.31, VN 4, TPH 1962
B Channel Protocol:	G.711
Regulatory Approval:	CE





### Connections (PI-6C Base Console)

Music On Hold Input:	3 pin XLR socket, balanced
Hybrid 1 & 2 Inputs:	2 x pin XLR socket, balanced
Hybrid 1 & 2 Outputs:	2 x pin XLR plug, balanced
Link to RCP:	RJ45 socket, link using CAT5 cable, pin to pin
Ethernet Port:	RJ45 socket
RS232 Serial Comms Port:	9-way 'D'-type socket
GPOI/O Remote I/O Port:	9-way 'D'-type socket
Mains Input:	Filtered IEC, continuously rated 85-264V AC @ 47-63Hz, fused 1A, max 10W

### Connections (PI-6R Remote Control Panel)

Local Headset:	2 x 3.5mm jack socket (mic input & headphones output)
Link to BC:	RJ45 socket, link using CAT5 cable, pin to pin
Ethernet Port:	RJ45 socket
Mains Input:	Filtered IEC, continuously rated 85-264V AC @ 47-63Hz, fused 1A, max 10W

### Physical Specifications

#### PI-6C Base Console

Dimensions (Boxed):	60cm (W) x 34cm (D) x 7cm (H) 23.6" (W) x 13.4" (D) x 2.8" (H)
Weight	Nett: 2.2kg    Gross: 3.2kg Nett: 4.8lbs    Gross: 7.0lbs

#### PI-6R Remote Control Panel

Dimensions (Boxed):	32cm (W) x 29cm (D) x 15cm (H) 12.6" (W) x 11.4" (D) x 5.9" (H)
Weight	Nett: 1.8kg    Gross: 2.9kg Nett: 4.0lbs    Gross: 6.4lbs

### Equipment Type

PI-6PSTN4	Phone In 6 system, 1 x PI-6C, 1 x PI-6R and 2 x PI-PSTN2
PI-6PSTN6	Phone In 6 system, 1 x PI-6C, 1 x PI-6R and 3 x PI-PSTN2
PI-6ISDN6	Phone In 6 system, 1 x PI-6C, 1 x PI-6R and 3 x PI-ISDN2
PI-6C	Phone In 6 Base Console
PI-6R	Phone In 6 Remote Control Panel
PI-PSTN2	Phone In 6 PSTN Card
PI-ISDN2	Phone In 6 ISDN Card



PHONE IN 6



PHONE IN 6

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