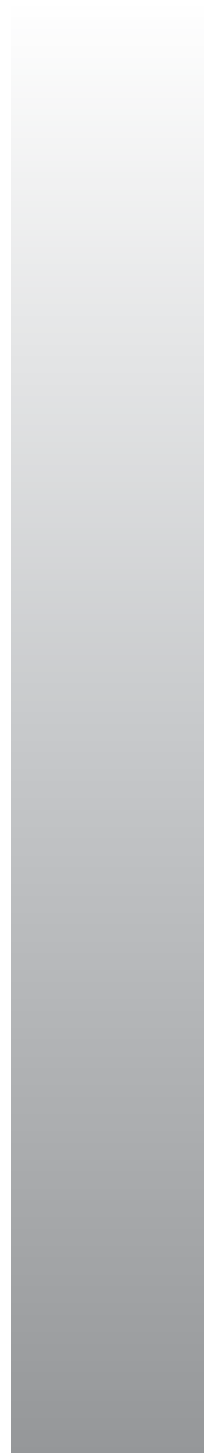
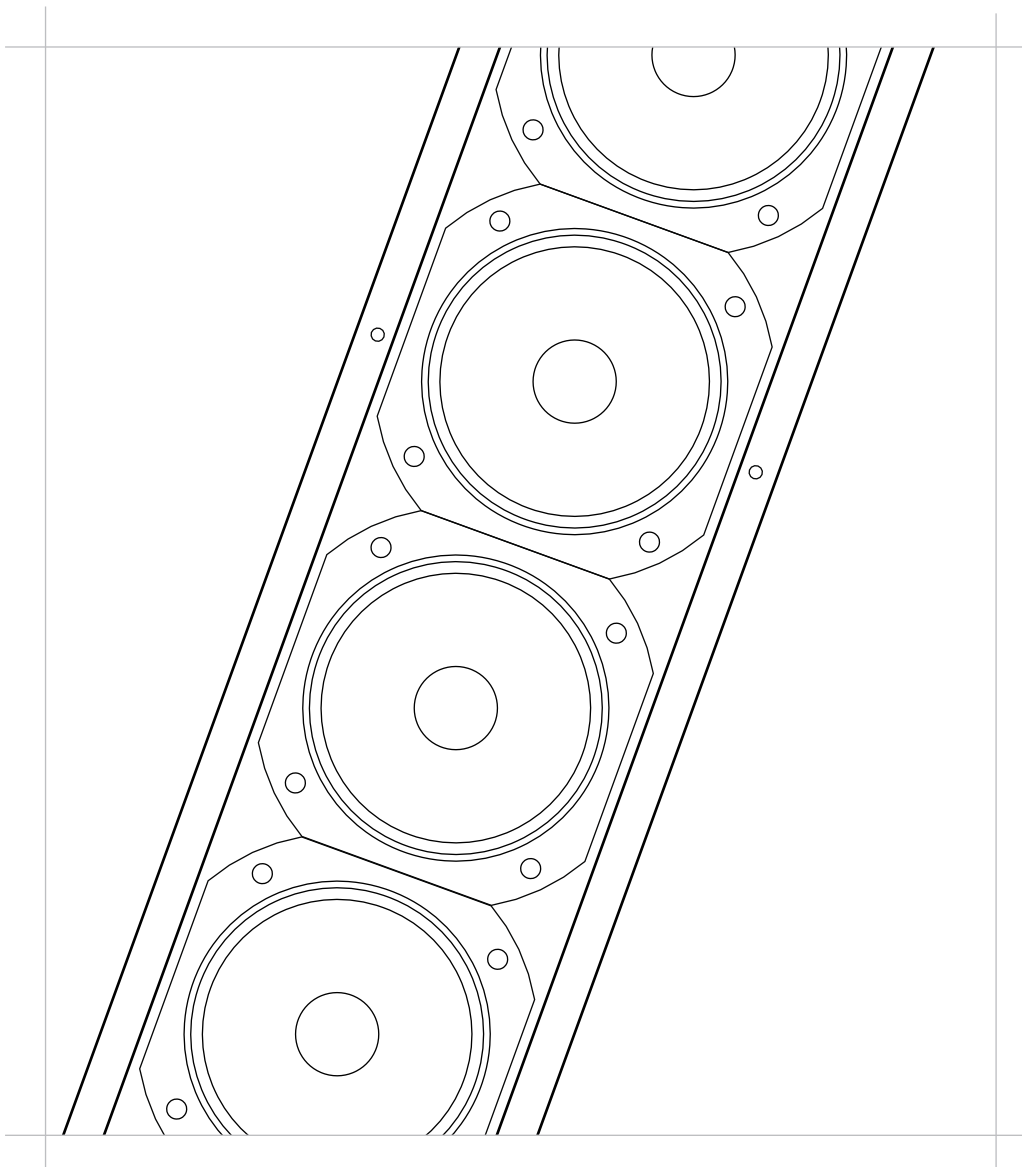


Installation Manual

JBL Professional Intellivox - DS/DSX 115, 180,
280, 380, 430 & 500 models

(Part Nos. 587000, 587001, 587020, 587021, 587040, 587041, 587060,
587061, 587080, 587081, 587120, 587121, 587140, 587141, 587160,
587161, 587180, 587181, 587300, 587301, 587350, 587351, 587480,
587481)



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EMC:

EN 55032:2015 + A11:2020

EN 55035:2017 + A11:2020

EN 61000-3-2:2019

EN 61000-3-3:2013

Safety:

EN 62368-1:2014 + A11:2017

Insulation:

Class1

Harman Professional, Inc.

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Warning: This equipment is compliant with Class A of EN 55032. In a residential environment this equipment may cause radio interference. This product must not be used in residential environment.

Warning: Any modification or changes made to this device, unless explicitly approved by Harman, will invalidate the authorisation of this device. Operation of an unauthorised device is prohibited under Section 302 of the Communications act of 1934, as amended, and Subpart 1 of Part 2 of Chapter 47 of the Code of Federal Regulations.

NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy, and if it is not installed and used in accordance with the instruction manual, it may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

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1. IMPORTANT SAFETY INSTRUCTIONS



This symbol is intended to alert you to the presence of uninsulated dangerous voltages within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock.



This symbol is used throughout this manual and is intended to alert you to the presence of important instructions.

- 1) Read these instructions.
- 2) Keep these instructions.
- 3) Heed all warnings.
- 4) Follow all instructions.
- 5) Do not use this apparatus near water.
- 6) Clean only with dry cloth.
- 7) Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
- 8) Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
- 9) Do not defeat the safety purpose of the polarised or grounding-type plug. A grounding-type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
- 10) Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
- 11) Only use attachments/accessories specified by the manufacturer.



12) Use only with the 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.

13) Unplug this apparatus during lightning storms or when unused for long periods of time.

14) Refer servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.



Warning -To reduce the risk of fire or electric shock, do not expose this apparatus to rain or moisture and objects filled with liquids, such as vases, should not be placed on this apparatus.



Warning - In order to disconnect this apparatus from the mains power supply, the connector should be removed from the mains socket located on the amplifier module.

Warning - Do not expose the internal backup battery to excessive heat such as sunshine, fire or the like.

Caution - Danger of explosion if the internal backup battery is incorrectly replaced. Replace only with the same or equivalent type.



Warning - The installer should ensure that the mechanical mounting method employed should be capable of supporting four times the weight of the unit (i.e., with a safety factor of 4). Always use all the brackets provided with the unit. Only skilled persons may install the units.



Warning - This apparatus is a Class I device and must be connected to a mains socket outlet that provides a safety ground connection.

2.INTRODUCTION

This manual describes the recommended installation procedure for the JBL Intellivox DS / DSX range of loudspeakers.

The JBL Intellivox is a type of loudspeaker known as an active DSP-controlled loudspeaker array, which utilises the principle of multiple, individually-driven loudspeaker drive units in the vertical plane at specific spacings. In addition to the drive units, the Intellivox housing contains a mains-powered electronics module containing multiple power amplifier channels and a Digital Signal Processing (DSP) section.

This manual describes the following aspects of an installation:

- Necessary cabling
- Connector wiring
- Mechanical installation

After installation, the loudspeaker should be tested for basic functionality using JBL WinControl software; the manual also describes this procedure. (Note that full configuration and control of the loudspeaker is beyond the scope of this manual; this topic is fully documented in the WinControl Help files.)



Please note that a full range of optional mounting brackets and connection coverboxes are available. Please refer to product data-sheets for further details.

** Models with the HD suffix offer increased directivity control for high frequencies.*

†The DS115 model is an exception, also employing two different driver types.

APPLICABLE MODELS, AND VARIANTS

The various models in the Intellivox range are fitted with different numbers of drive units.

This manual applies to the following JBL

Intellivox models:

Intellivox-DS115 (fig.1a)

Intellivox-DS180 and DSX180 (fig.1b)

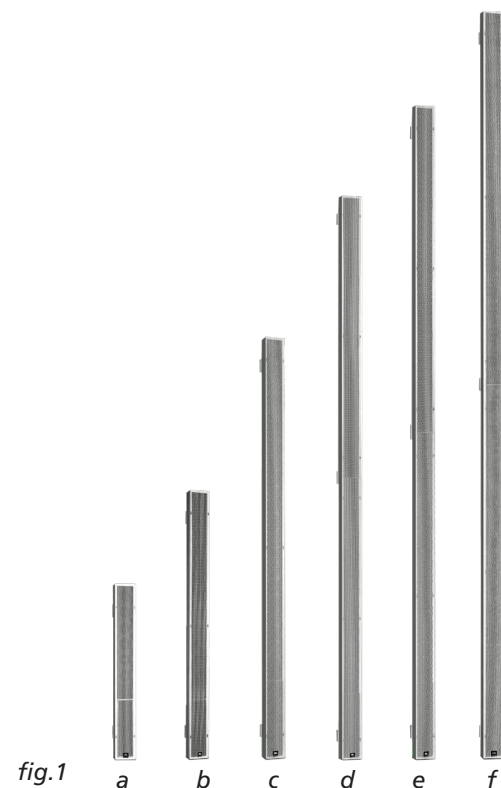
Intellivox-DS280, DSX280 and DSX280HD* (fig.1c)

Intellivox-DS380 and DSX380 (fig.1d)

Intellivox-DS430 and DSX430 (fig.1e)

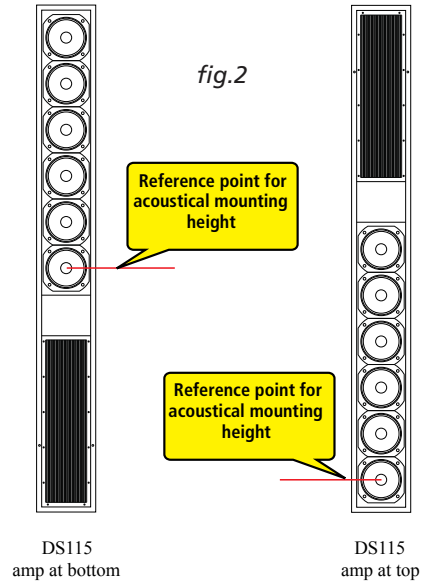
Intellivox-DS500 and DSX500 (fig.1f)

The DSX models use two different types of drive units in each loudspeaker instead of the DS's single type[†]. These model differences may be ignored for the purposes of installation and commissioning.



The Intellivox models covered by this manual

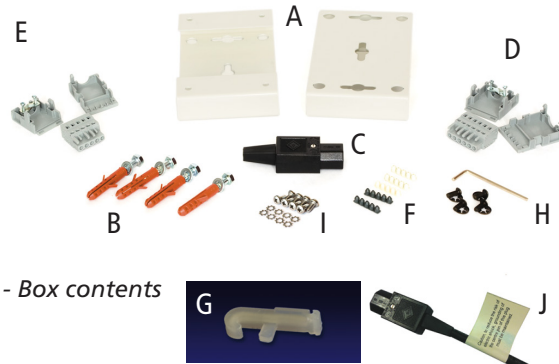
A standard option applicable to all models is the position within the housing of the electronics module, which may either be at the top or bottom of the housing. The position is relevant to the installation procedure as the "acoustic centre" (see fig 2) of the loudspeaker array will be different in the two cases. It is not possible for the electronics module's position to be changed after production.



WHAT'S IN THE PACKAGING

In addition to the loudspeaker itself, each unit is shipped with the following items:

- Installation manual (this document)
- Datasheet specific to the model
- Box containing:



REF	ITEM	QTY	USE
A	Mounting brackets	2 or 3*	Speaker mounting
B	Set of 30 mm hex-head screws with washers and wall plugs	4 or 6*	Mounting bracket fixings (wall)
C	Female IEC mains connector	1	AC input
D	6-pole female WAGO connector, with cover	1	Mating connector for audio
E	5-pole female WAGO connector, with cover	1	Mating connector for RS-485 control port
F, G	Set of PVC inserts for WAGO connectors, with wire insertion tool	1	WAGO connector wiring
H	Set of M4 x 10 round-head screws with star retaining washers	4 or 8*	Grille retaining screws
I	M5 x 12 pan-head screws with shakeproof washers	8 or 12*	Mounting bracket fixings (loudspeaker)
J	Caution Label	1	Mains cable labeling

* depending on model



The mounting brackets, screws and wall plugs as well as the connector set are packed together in a separate box enclosed in the main packaging.

3. INSTALLATION GUIDE

PREPARING FOR INSTALLATION

Before starting to install the Intellivox loudspeaker, a number of points should be considered.

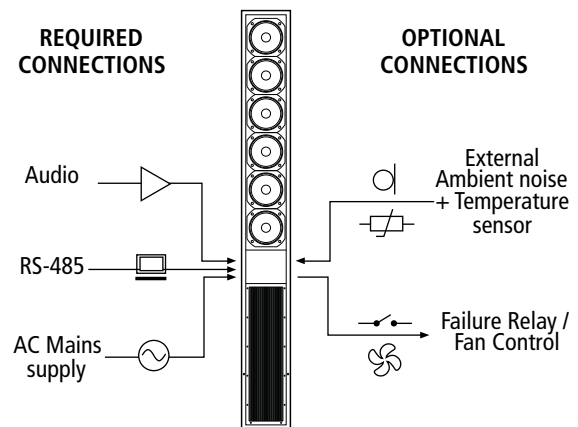
- It is assumed that the installation site has been the subject of an extensive DDA investigation or optimisation prior to the actual install. (DDA = Digital Directivity Analysis, the proprietary simulation and optimisation software for these products*). This procedure will have identified the optimum physical location for the Intellivox, to accurately achieve the desired acoustic coverage. In particular, the "acoustic centre" position will have been specified, in terms of height above the finished floor. The installer should confirm that he/she has this information.

- Unless specified otherwise by the sound system designer, the Intellivox column should be installed at a position exactly perpendicular to the listening plane (i.e. vertical if the floor is horizontal). Unlike conventional loudspeaker systems, minor mechanical misalignment may lead to degraded coverage and intelligibility. Ensure (by use of a levelling device such as a spirit level) that the surface to which the Intellivox is to be attached is absolutely vertical and that all mounting positions (2 or 3 depending on model) are in the same plane.

- The Intellivox is configured to operate from either 230 V or 115 V AC mains. A suitable AC mains outlet should be provided adjacent to the loudspeaker's intended mounting position, taking the position of the electronics module into account. The outlet must be on a circuit able to handle the full-load power consumption as well as supply the maximum in-rush current drawn by the electronics module; these figures vary with model, and can be found in the datasheet supplied with the unit. The third terminal of the mains outlet must be connected to a proper safety ground. Local safety regulations may require a separate mains distribution network or an uninterruptible mains power supply (UPS).

SIGNAL AND CONTROL CABLES

- In addition to the mains supply, some or all of the following cables (shown in fig 4) will need to be run to the loudspeaker position. The necessity for each of these will have been determined by the system designer; the installer should ensure that he/she has these details to hand. Depending on the specific access issues, it may be better to ensure that these cables are in place and correctly terminated "ready-to-plug-in" before the Intellivox is mounted in position. All wiring details can be found on pages 9-15.



- Audio inputs: the Intellivox accepts line level audio *fig.4 - Intellivox Connections*

(0 dBV). Two separate transformer-balanced audio inputs are provided; however, units are shipped with only input 1 active. Input 2 can be made active via WinControl. Alternative input sections are available separately: accepting either one line level input and one 70 V/100 V input or two 70 V/100 V inputs. This option needs to be specified at the time of ordering.

- Network connection: all Intellivox products are configured, and may also be monitored, from a PC running WinControl software. With all installations it will be

*Authorised electro-acoustic consultants or 'build & design' sound contractors can download the DDA software from our website at <http://www.jblpro.com>

For further information please refer to the Help files and manual with the DDA software.

necessary to upload the correct settings for each unit to obtain the desired acoustic coverage. Once this has been done, there is no longer an operational need to have the Intellivox connected to a PC because all settings are stored locally within the unit's memory and in the event of a power failure, will be automatically reloaded on power-up. The system designer will have determined whether a permanent network connection needs to be provided. This will be the case if the Intellivox is to be monitored remotely during normal operation. Otherwise, the network wiring can be omitted, but consideration should still be given to the unit's location with regard to ease of both initial and future access for a PC connection. It may be appropriate to install network wiring in order to provide a network access point at a location more easily accessible than the rear of the Intellivox unit itself. A cable with two individually foil-screened twisted pairs should be used. Details of suitable cables can be found on page 24.

- **Fault monitoring:** if network monitoring is not to be used, a simple surveillance function may be realised by means of the Intellivox's 'failure detect' volt-free relay. This connection requires a 2-core cable.
- **Additional cooling:** if the ambient temperature is expected to exceed 40 °C an external fan should be installed. This may be activated automatically via the Intellivox's temperature-controlled fan output; 2-core cable will be required. The fan should be mounted in a position which ensures sufficient airflow around the heatsink.
- **Ambient Noise Sensing:** the Intellivox is equipped with a built-in microphone to provide a signal for its embedded autogain algorithm.

CONNECTOR AND WIRING DETAILS

All connections to the Intellivox (except mains power) are made via the connector block at one end of the electronics module. The IEC mains socket is immediately adjacent to the connector block.

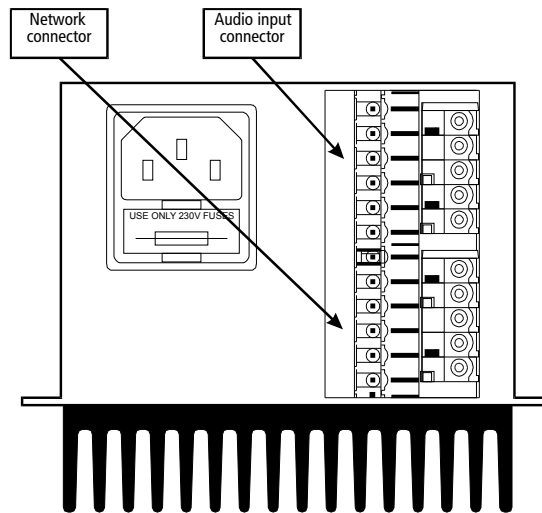
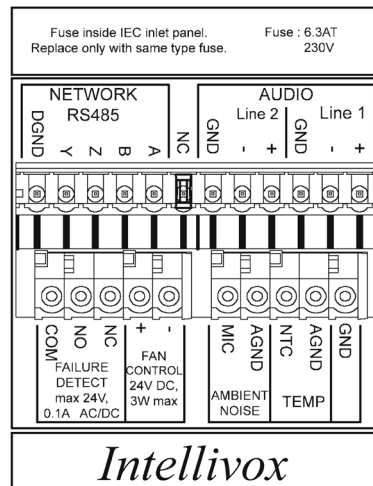


fig.5.1 - Intellivox Connector block



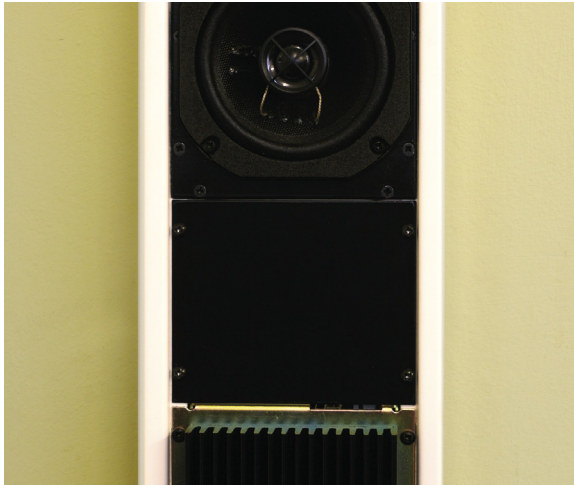
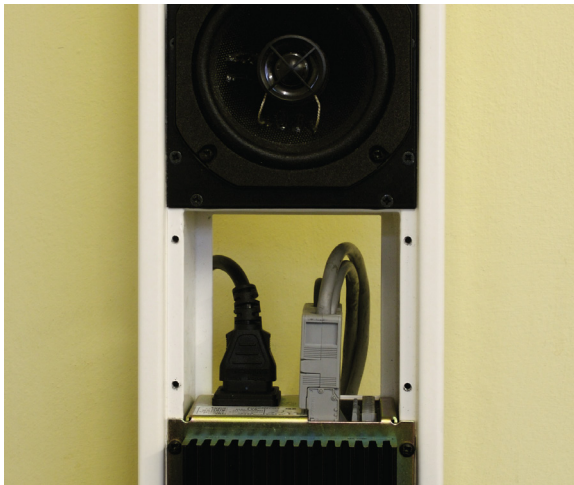


fig.5.2 - Additional access to connector block via the front cover plate



Additional access to the connectors is available via the connector plate located between the amplifier and loudspeaker baffle. Removal of the front grille will be necessary to gain access.

AC MAINS



The Intellivox is equipped with a 3-pin IEC mains connector with an integral fuse holder. Only ever replace the fuse with one of the same type and rating. Never attempt to replace a fuse without first removing the IEC plug from the unit. Be sure that the mains voltage stated on the unit complies with the local standard before connecting the Intellivox to the mains supply. Be sure to use the appropriate cable diameter for the power consumption of your particular Intellivox model.

A pre-made IEC mains cable (with the appropriate plug for the territory) may be used if one of a suitable length is available. Otherwise, use the mating IEC cable socket supplied, and wire to the intended mains outlet. Note that this connector is only suitable for use with stranded "appliance" cable, not rigid mains installation cable.

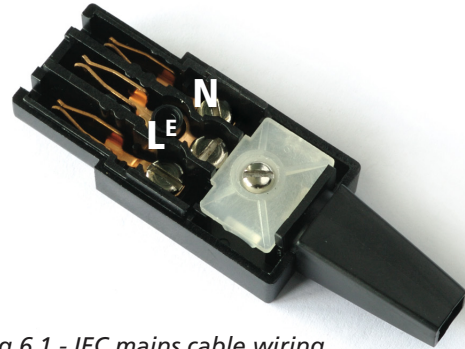


fig.6.1 - IEC mains cable wiring

TERM	EURO	USA
L	Brown	Black
E	Green/yellow	Green
N	Blue	White



Warning – This apparatus is a Class I device and must be connected to a mains socket outlet that provides a safety ground connection.

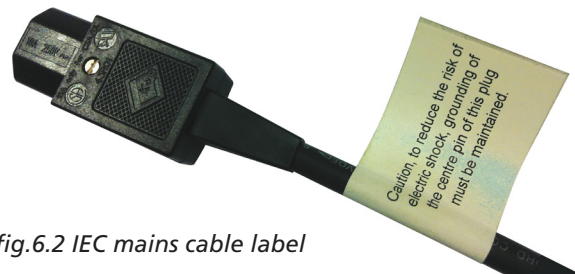


fig.6.2 IEC mains cable label



Warning– The caution label contained in the Intellivox standard connector set must be placed in close proximity to the IEC female cable plug as indicated in fig.6.2.

WAGO CONNECTORS

All other Intellivox connections are made via the four on-board WAGO Type 231 multi-pin connectors. These are:

- Audio (6-way male)
- Network (5-way male)
- Ambient noise mic/Ext. temp. sensor (5-way female)
- Failure detection/Fan control (5-way female)

One 5-way and one 6-way mating female connector is supplied with every unit for the network and audio connections. 5-way mating male connectors for the other two sockets are available separately from JBL if required (see page 22), but will be shipped with the unit if specified at the time of order.

To wire the WAGO Type 231 connectors, proceed as follows:

- 1) Prepare the cable; strip back approximately 8-9 mm (0.35") of the insulation of each core.
- 2) Refer to the table below: select the appropriate PVC insert for the wire size. If the wire is too big for the largest size insert, the inserts can be ignored and the wire connected directly (next step). Insert the wire into the insert so that the bare end goes through the hole but the insulated portion does not.

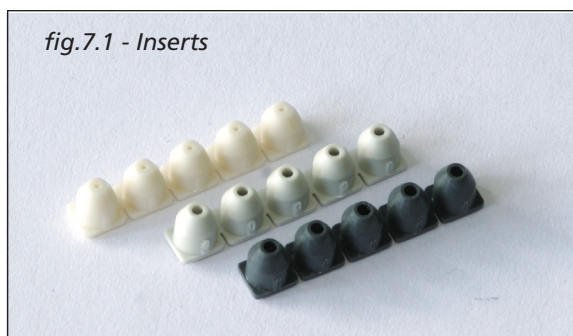


fig.7.1 - Inserts

WIRE SIZE	INSERT COLOUR
0.08 to 0.2 mm ²	White
0.25 to 0.5 mm ²	Light grey
0.75 to 1.0 mm ²	Dark grey

- 3) Using the wire insertion tool supplied as shown below, open the clamp contact in the connector shell by pressing inwards towards the shell.

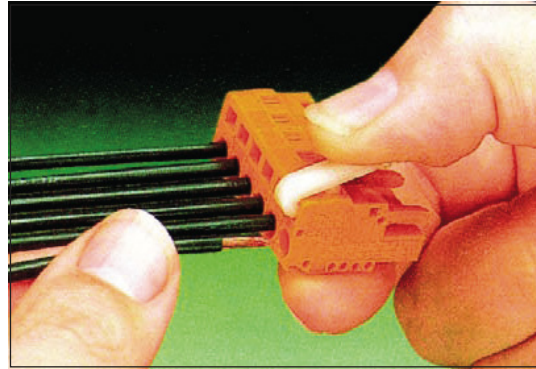


fig.7.2 - Using the WAGO insertion tool

- 4) Insert the stripped wire, with or without a PVC insert, into the hole as shown. If using an insert, ensure that it is fully seated. Release the wire insertion tool, and check that the wire is secured. Repeat from Step 2 for all other cores.

AUDIO INPUTS

The Intellivox is normally supplied with two transformer-balanced line inputs. Selection of Input 1 or Input 2 as audio source is made from the WinControl software via the network, and for most installations only Input 1 need be wired. However, Input 2 may be connected to a secondary signal path (in case of a failure elsewhere in the system), or to an emergency sound source.

For optimum results only use good quality balanced audio cable consisting of a twisted pair and an overall screen. The audio source(s) (e.g. the Octadrive) should have a low impedance balanced output. The nominal line input level is 0 dBV.

For applications requiring direct connection to a 70 V/100 V distributed loudspeaker system the Intellivox may be ordered with an alternative input module having either one 70 V/100 V audio input and one 0 dBV line level input or two 70 V/100 V inputs. Refer to Appendix for order codes.

The audio connector pinout is as follows:

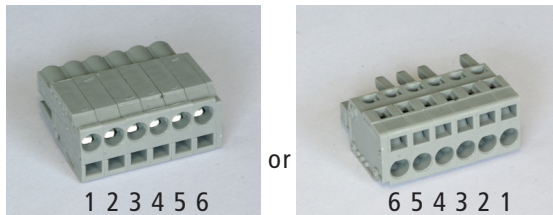
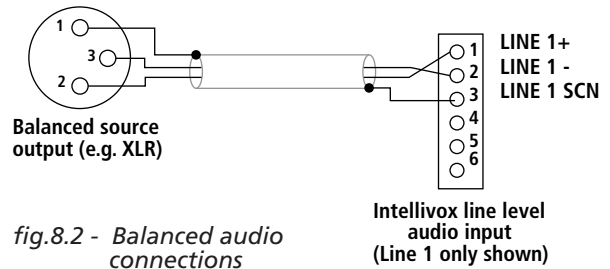


fig.8.1 - Audio input connections

PIN NO.	STANDARD VERSION		1 X 70 V/100 V 1 X LINE VERSION		DUAL 70 V/100 V VERSION	
1	Line level audio input 1 (0 dBV)	Line 1 +	70 V/100 V input*	70 V/100 V +	70 V/100 V input*	70 V/100 V +
2		Line 1 -		70 V/100 V -		70 V/100 V -
3		Line 1 Screen		GND (n/c)		GND (n/c)
4	Line level audio input 2 (0 dBV)	Line 2 +	Line level audio input (0 dBV)	Line +	70 V/100 V input	70 V/100 V +
5		Line 2 -		Line -		70 V/100 V -
6		Line 2 Screen		Line Screen		GND (n/c)

*A simple failure monitoring scheme based on impedance switching can be implemented on this 70 V/100 V input. Refer to the Appendix (page 25) for details.

If the source equipment has a well-designed balanced output and the wiring strategy shown below is used, there should be no problems with hum or other extraneous noise. Note that pins 3 and 6 of the audio connector are analogue audio grounds, they should be used only for connecting the screen of the audio cables, and for no other purpose.



Due to the complex architecture of some large audio systems, unexpected hum or noise may occur due to ground loops, or injected noise from other equipment elsewhere in the system. If this occurs, please refer to the Appendix (p24) and to our website, where additional guidance on grounding strategies will be found, with general techniques that may be applied in order to reduce ground-induced noise.

NETWORK CONNECTION

The RS-485 network connection should be permanently wired in any of the following situations:

- The Intellivox is to be constantly monitored in operation.
- The physical location of the Intellivox makes access to the network connector problematical.
- It is not practical (e.g. on a large scale installation) to configure each device locally.

The RS-485 interface permits multiple Intellivox units to be "daisy-chained" in parallel, so that they are controlled by the same PC. In such a system, each Intellivox must have its own unique network address; this is determined via WinControl for each individual loudspeaker.

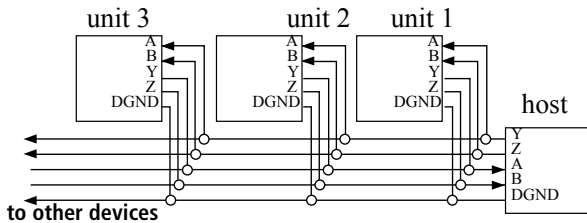


fig.9.1 - Multiple units "daisy chained" in parallel

The network connection should be wired as shown in the table and diagram below:

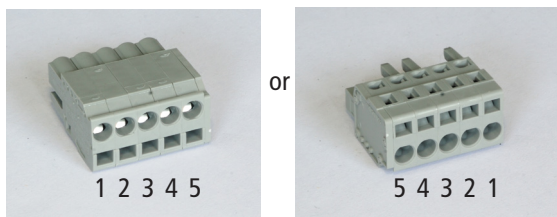


fig.9.2 - Network connections

WAGO PIN NO.	XLR5 PIN NO.	LABELLED	FUNCTION
1	5	A	Data Rx +
2	4	B	Data Rx -
3	3	Z	Data Tx -
4	2	Y	Data Tx +
5	1	DGND	

Note that the table above contains information with respect to 5-pin XLR wiring. A 5-pin XLR connector is commonly used to connect the network to the USB to RS-485 converter.

Note that 2-pair, individually-screened cable should be used for RS-485 connection. The transmit (Tx) and receive (Rx) balanced data lines must be wired via their own twisted pairs.

CAT-5 type UTP or FTP cable is NOT suitable. Please refer to the Appendix section of this manual for cable specifications.

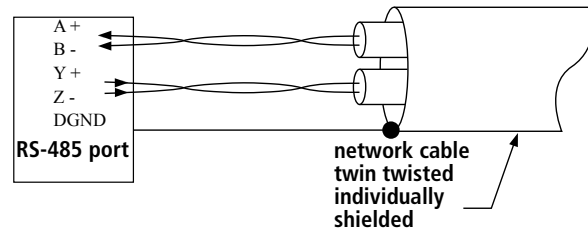


fig.9.3 - Twisted pairs

The maximum cable length over which the network connection will operate reliably depends on the cable type and the baud rate used. With good quality cable, a safe maximum figure (at 19.2 kbaud) is 2000 m. If the distance is significantly longer than this, a network repeater will be required.



Before connecting multiple devices to the same network subnet, ensure that their network addresses do not overlap. Each device should be set to a unique network address (determined via WinControl).



In some installations, it is normal practice to disconnect the RS-485 network from the USB to RS-485 converter at the host (computer) during normal operation. This removes the possibility of extraneous data being inadvertently transmitted over the network. In such a situation, the converter is only reconnected when system maintenance or checks are required. Disconnecting from the converter in this way leaves the Rx lines of the devices unterminated. In most situations this does not present any problems, but with a large network in a hostile EMC environment, it is recommended that the host Y and Z lines (host Tx/device Rx) are terminated in a 100 ohm resistor for normal operation. This can be easily achieved by plugging the XLR5 female connector into a spare male connector with the resistor on the appropriate pins. This termination can then be removed and the converter reconnected when necessary. (If there is any doubt about which pins should be terminated, shorting all five pins will generally be equally effective.)

Further information on the RS-485 network can be found in the RS-485 converter manual and in the WinControl Help files.

FAULT MONITORING/FAN CONTROL CONNECTOR

The pinout of this connector is as follows:

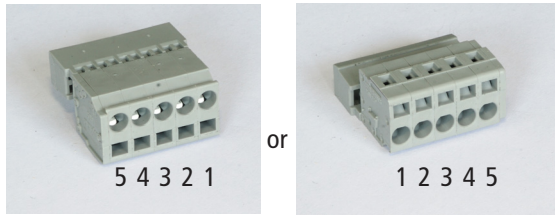


fig.10.1 - Failure relay / fan control connector

PIN NO.	LABELLED	USE
1	COM	Failure relay Common
2	NO	Failure relay Normally Open
3	NC	Failure relay Normally Closed
4	+	Fan +
5	-	Fan -

Although accessed via the same connector, the fan control and failure relay functions are independent of each other and either or both may be used, as required.

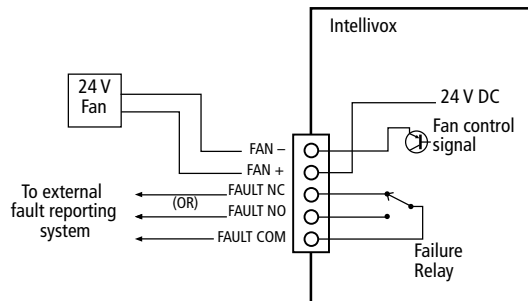


fig.10.2 Fault monitoring / fan control connections

The diagram above illustrates how this connector may typically be wired.



Please note that Failure Relay and SPL/Temp sensor connectors are both of the same type, do NOT interchange!

Fault Monitoring

The Intellivox includes a single-pole changeover relay whose contacts are accessible on the Failure Relay connector. The conditions under which the relay operates are defined as part of the device configuration in WinControl. The relay connections may be configured either as volt-free, or with additional internal resistors to allow them to be connected directly to impedance-sensing line monitoring equipment*. This selection is made by moving an internal PCB jumper, refer to the Appendix for details.

In volt-free operation, COM is connected to NC; a failure condition causes COM to be connected to NO.

When configured for impedance-sensing use, the impedance between COM and NC is 10k Ω and open-circuit between COM and NO in normal operation. When a fault condition occurs, the impedance between COM and NC rises to 20k Ω , and COM is short-circuited to NO. Impedance-sensing fault monitoring equipment may be connected to COM and NC.

The relay contacts have maximum current and voltage ratings of 100 mA and 24 V respectively.

*Intellivox devices with early serial numbers do not have the option of re-configuring the volt-free relay contacts for impedance-sensing operation. Please contact the service department for more information.

Fan Control

An external cooling fan should be installed if the ambient temperature is expected to exceed 40 °C and/or the Intellivox will be exposed to direct sunlight. Dedicated forced cooling solutions however can be constructed by means of the information provided in this section.

An internal temperature-controlled output is available at two pins of the connector; these pins should be wired to an external 24 V DC fan as indicated in fig 10.2. One of the pins is connected to an internal positive supply rail (FAN+, approximately 24 V), the other one (FAN-) is driven by an internal transistor. Note that external protection diodes are normally not required, the FAN- signal is diode-clamped both to the internal positive supply rail as well as to the internal GND.

The fan should be a 24 V DC type consuming less than 3 W.

Applicable fan types are:

EBM-Papst 8314.

EBM-Papst 8414.

Sunon KDE2408.



Please note that the FAN- signal is a PWM (Pulse Width Modulated) signal. This control results in a temperature dependent fan speed.

It implies that this signal cannot be used to directly drive an external relay (e.g. to control a mains-voltage fan). Contact JBL for details with respect to the interfacing to mains-voltage fans.



Ensure that the airflow of the fan enhances the natural airflow (caused by convection).



Note that the supply available at the fan control connector has a maximum current rating of 125 mA. Fans or any other loads consuming more than 3 W should not be connected. This might result in the activation of an internal protection*.

**For Intellivox devices with early serial numbers this protection is non-resettable. Please contact the service department for more information.*

EXTERNAL AMBIENT SPL/TEMPERATURE SENSOR

The pinout of this connector is as follows:

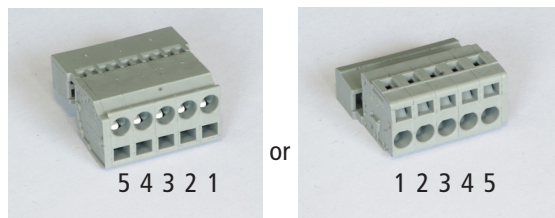


fig.11.1 - External ambient SPL/Temperature sensor connector

PIN NO.	LABELLED	FUNCTION
1	MIC	ANS mic +
2	AGND	ANS mic -
3	NTC	Temp Sensor +
4	AGND	Temp Sensor -
5	GND	Screen

Although accessed via the same connector, the external ANS microphone and temperature sensor functions are independent of each other and either or both may be used, as required. The use of the optional JBL combined Ambient SPL/Temperature sensor is recommended, although either of the two functions may be used alone if wished.

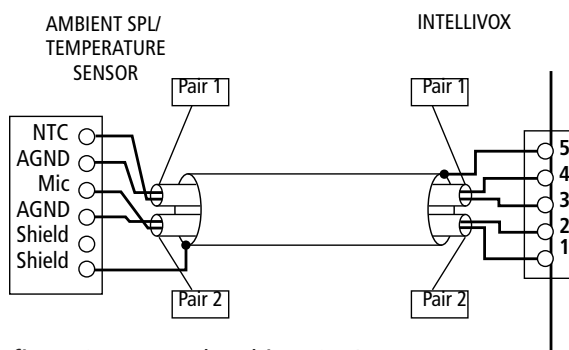


fig.11.2 - External ambient SPL/Temperature sensor connections

The diagram above illustrates how this connector should be wired to the optional combined sensor using twin twisted-pair cable with an overall screen. Note that there are two AGND terminals on both the Intellivox and the sensor; care should be taken not to confuse these, and in particular, not to connect AGND to GND at any time.

External Ambient SPL Sensor

The Intellivox incorporates an autogain algorithm which intelligently alters the volume of the audio according to the ambient noise level. An internal microphone is fitted to monitor the ambient noise level in the gaps in programme material. The autogain function is activated and adjusted via WinControl. This automatic volume adaptation feature will only give good results if the signal measured by the microphone is truly representative of the diffuse ambient noise level, and in some circumstances it may be preferable to monitor the ambient noise at a position remote from the Intellivox itself. Connecting the external ambient noise sensor automatically disconnects the internal microphone.

Care should be taken in selecting a suitable location for the external sensor; it should not be near direct sound sources such as people talking, air conditioning system outlets, or other constant noise sources such as electrical plant, etc. The most favourable external sensor locations are walls or ceilings (height > 3 m) within the coverage range of the Intellivox.

Temperature sensor

The external temperature sensor is for activating the Intellivox's frost detection system, and should be connected if it is anticipated that the ambient temperature may drop below 0 °C. If it does, an internally-generated pilot tone is applied to the drivers, warming the voice coils slightly, and thus preventing any build-up of moisture in the magnet gap. Note that this pilot tone is always generated if the internal load monitoring surveillance function is enabled. In that case the ambient temperature sensor is not required.

MECHANICAL INSTALLATION

Acoustic Centre

Mounting an Intellivox loudspeaker is a straightforward procedure, but it is essential to understand that the height of the unit above floor level is extremely critical. The “correct operational height” is defined as part of the acoustical design process and the installer should make sure that he/she has this information before commencing to mount the Intellivox.

The correct operational height defined by the system designer is the height of the Intellivox’s acoustic centre. This point does not necessarily coincide with the position of any particular physical component on the unit. The location of the speaker’s acoustic centre is marked by the centre of the yellow sticker on the front face of the unit at the time of shipping, and it is this position that must correspond to the operational height defined in the design process. The “vertical” position of the acoustic centre relative to the bottom of the unit varies from one Intellivox model to another, though it will always be on the vertical centre line.



fig.12 Sticker showing acoustic centre and unit orientation

When calculating the positions for the mountings (see page 18), the distance from the acoustic centre to the top or bottom of the loudspeaker (whichever is being used as the reference datum) should be measured and then allowed for when marking the mounting positions. The model-specific specification sheet supplied with each loudspeaker includes a mechanical drawing clearly showing the mounting position locations.

Because of the extreme tight vertical radiation pattern of the Intellivox, a small deviation from the calculated acoustical mounting height may cause severe degradation of the expected performance.



Note also that the yellow sticker indicates which way is “up”; ensure that this orientation is observed.



Ensure the protective blue foam behind the grille and the acoustic center sticker are removed before operation.

Mounting Options

The Intellivox has two or three (depending on the model) attachment points at the rear of the enclosure; the device should be mounted using the appropriate brackets fixed at these points. Each point consists of four M5 threaded inserts and only the screws supplied with the original mounting hardware should be used.



The threaded inserts are M5 metric and the depth is 16 mm.

There are three options for mounting the Intellivox column:

1. The first (and most often used) method is to use the standard mounting brackets supplied with the unit. Two or three brackets will be supplied, according to the Intellivox model. Dimensions of the bracket are shown in the drawing below.

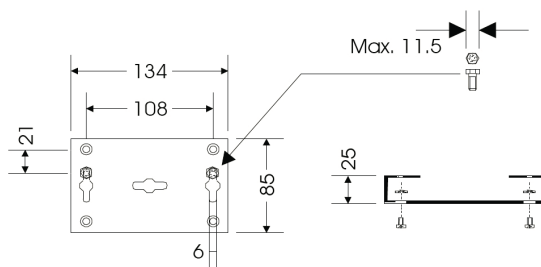


fig.13.1 - Standard bracket dimensions in mm

The standard brackets allow mounting of the Intellivox on a straight wall or on a curved surface (e.g., a pillar) with a gap of 25 mm (1.0") between the rear of the enclosure and the wall. If the unit requires three mounting points (as on the larger Intellivox models) ensure that all three points are in the same plane, to avoid the unit being bent when the screws are tightened.

The mounting procedure is given on page 18 under "Mounting Procedure".

2. A second method is to mount the Intellivox using (optional) swivel brackets which allow the plane of the column's vertical radiating axis to be at an angle other than 90 degrees to the wall. In this case two or three (depending on the model) swivel brackets are needed. The horizontal angle of the swivel brackets can be secured by the hexagonal nut. The swivel brackets are mounted to

the rear of the enclosure by the four M5 pan head screws instead of the standard brackets. Two versions of swivel bracket are available, permitting the Intellivox to be rotated through 45 or 90 degrees either way respectively. Refer to page 22 for ordering information.

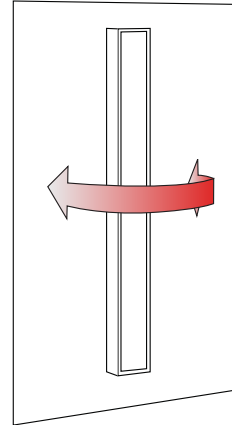


fig.13.2 -Direction of rotation when using swivel brackets

3. The third method is to mount the column within a recess in the wall or dedicated mounting panel so that the front of the unit is flush. This is a specialised mounting situation which will be encountered only rarely. In this case longer M5 screws than those supplied will be required, and it should be noted that the threaded inserts on the rear of the enclosure are 16 mm deep. Access to the rear of the unit will still be required for the cables. Because of the proximity of the unit to the walls, particular attention should be paid to the avoidance of acoustic resonances.

With all mounting methods, it is advised to keep the rear side of the Intellivox free from the wall in order to prevent unwanted resonances. If mounting the unit onto or into a cavity wall, it is advisable to insert rockwool or similar sound-absorbing material into the cavity in the vicinity of the loudspeaker.

Accessories are detailed in the back pages of each of the Intellivox datasheets which can be downloaded from <http://www.jblpro.com>

Mounting Procedure

The general mounting procedure using the standard brackets is described below. It is assumed that all necessary cabling is already prepared with connectors fitted as described in the previous chapters.

Proceed as follows:

1. Use of the wall plugs and hexagon head screws supplied is recommended. If using other types, ensure that the "across-flats" head size does not exceed 11.5 mm (0.45").
2. Mark and drill the holes (8 mm) for the wall plugs. Use the two holes with the slots running vertically (refer to Fig 13.1).
3. Insert the plugs and screws into the holes. Tighten the screws with a spanner, but stop with a few mm of screw shaft visible between the head and the wall.
4. Check that it is possible to slide a bracket over the heads.
5. Check that the chosen mounting points will position the column in the correct vertical angle specified by the acoustic design (which is usually exactly perpendicular to the listening area). Use spacers on one or more of the brackets if necessary.
6. Using a Philips H2 Screwdriver, attach the brackets to

the Intellivox enclosure with the M5 x 12 pan-head screws and shakeproof washers supplied. The 10 mm dia. holes allow screwdriver access to the screw heads.

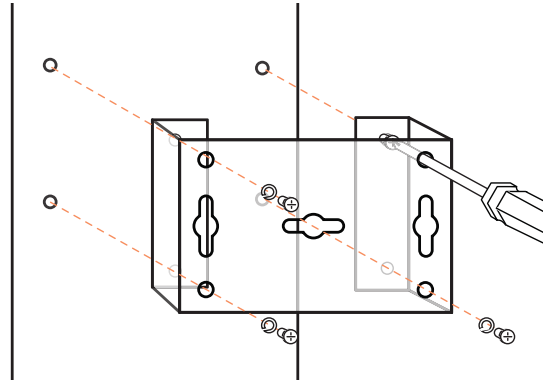


fig.14 - Bracket attachment

7. Lift the Intellivox and slide the brackets over the heads of the hex-head screws protruding from the wall.
8. Firmly fasten the screws securing the brackets to the wall. Re-check the verticality (or other angle if specified) with a spirit level or similar levelling device.
9. Remove the front grille(s) from the Intellivox by gently lifting the grille at the locations of the 'snap-on' fittings which hold it in place. Remove the protective foam. Unscrew the four self-tapping screws securing the connector compartment cover and remove the cover. Thread all cabling through the connector compartment from the rear so that it is free and accessible from the front.
10. Terminate and plug in all the connectors (see fig 5.1) and replace the connector compartment cover and the grille(s)*.
11. Secure grille(s) at each corner with supplied M4 round head screws and star retaining washers.

**If it is intended to connect a PC directly to the Intellivox to carry out the settings file upload (see page 19), leave the network connector (if any) unplugged and do not replace the connector compartment cover until the upload and verification procedure has been carried out.*

4. UNIT CHECKS

After installation and connection are complete, the installer should upload the settings file into the Intellivox and verify correct operation with WinControl software.

This section of the manual describes only the file upload and a simple verification procedure. It assumes that a laptop (or other computer) with both WinControl software and a driver for the RS-485 interface already installed is available, with the RS-485 interface. It also assumes that the installer has the settings files, prepared by the system designer, for each Intellivox loudspeaker making up the system. These may be elsewhere on the laptop's hard drive, or may be supplied separately on removable media such as a memory stick or a CD-ROM. No previous knowledge of WinControl is necessary, but basic familiarity with Windows file handling is required.

A full description of WinControl is beyond the scope of this manual and further information is available in the application's Help files. The latest version of WinControl can be downloaded from <http://www.jblpro.com>. Instructions on the use of the RS-485 interface are included with the interface itself.

CONNECTING THE PC TO THE INTELLIVOX

If connecting directly to the Intellivox, use the 5-pin XLR to WAGO cable (supplied with the WinControl Program Set) and plug the WAGO connector into the loudspeaker's network socket. Connect the other end to the RS-485 output socket on the RS-485 interface. If the network connection to the Intellivox has been made permanent and network access is consequently in a different physical location, connect the PC at this point, using a different (installation-specific) cable if necessary.

The RS-485 interface should then be connected to the PC's USB port.

SETTINGS FILE UPLOAD

- Apply mains power to the Intellivox, turn on the PC and launch WinControl. Open **Options > Communications options**, and confirm that the Off-line box is unchecked and that the correct COM port is selected. Close the Communication options dialogue box. If the PC is connected to only one Intellivox, a screen similar to that shown below should now be displayed.

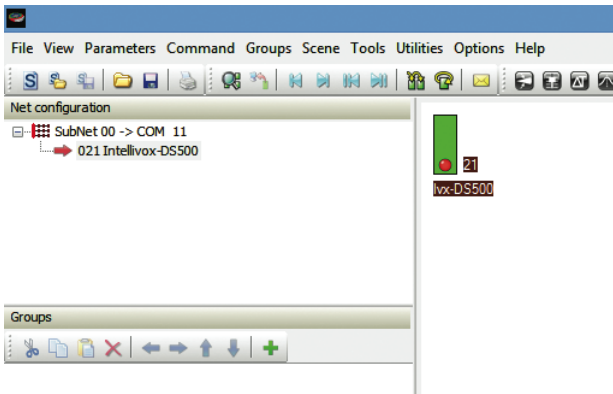


fig.15.1 - WinControl connected to single unit

The green rectangle in the main pane represents the Intellivox. The model number is shown below and the unit's current network address to the right. If a complete network comprising multiple Intellivoxes is being accessed, additional similar rectangles will be displayed.

- If the display does not look like that shown, click on **Command > Netscan** to force the PC to re-scan the network. (This will be the case if the Intellivox(es) were unpowered when WinControl was launched.) If this fails to produce the correct display, please check all network connections, and that the correct port on the PC is selected (open **Options > Communications options** to do this).
- Select the Intellivox to have its settings file uploaded by clicking on it once, highlighting its model number and address, if it is not already highlighted.

Click **File > Load settings...**, which will open the two dialogue boxes shown below, *Load control parameters settings* and *Control parameters*.

File Name field Browse button

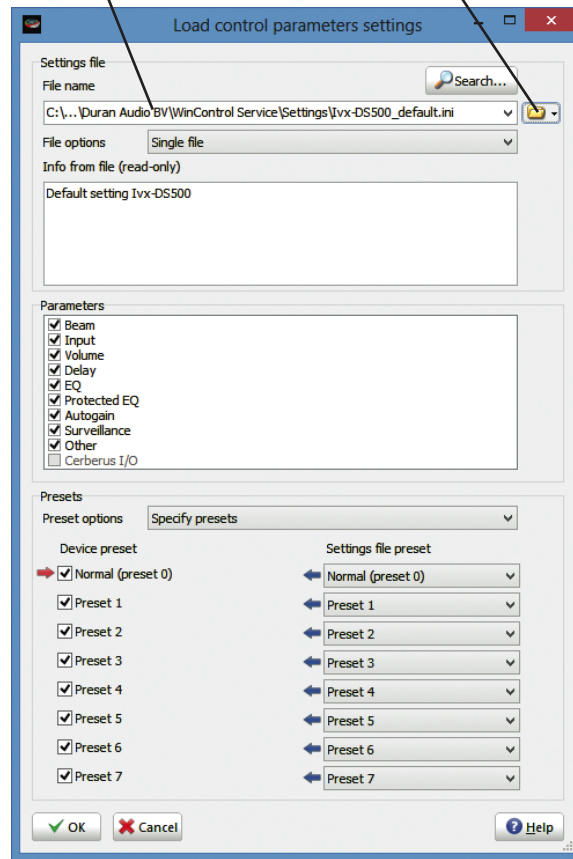
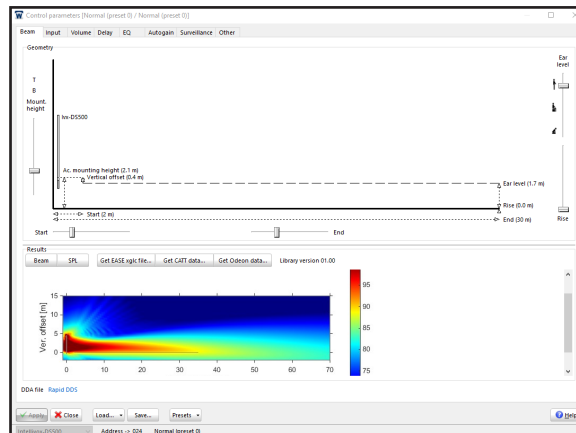



fig.15.2 - Uploading the settings



- The File Name field (at the top of the *Load control parameters settings* dialogue box) indicates the last-used settings file name. If this is the first time that the installation of WinControl has been used, a default settings file is selected. The default location for this file is in [My Documents folder]\JBL\WinControl\Settings, though as this is alterable, it is possible that a different location may be displayed, depending on how the particular PC being used has been set up. To navigate to the location containing the settings file to be uploaded, click on the Browse button  (the folder symbol to the right of the File Name field), which will open a further *Open dialogue box*. Navigation may be continued in the normal Windows manner. Note that Intellivox settings files always have an *.ini file extension.
- Select the correct settings file and click **Open**. Then in the *Load control parameters settings* dialogue box, ensure that the proper parameter groups are selected and specify the preset(s) to be uploaded, click **OK*** to continue. An *Info* dialogue box will then open showing additional information, in this box click **OK** to start the upload process. This will transfer the pre-determined Intellivox parameters to the loudspeaker. The *Control parameters* dialogue box can now be closed and the upload is complete.
- If there are further loudspeakers on the network to have their settings files uploaded at this time, the procedure can be repeated by selecting the next Intellivox. It is possible to load the same settings file into several Intellivoxes simultaneously, should the installation require this. See *Addresses and Groups* in the WinControl Help file for more information.

* See *WinControl Help files* for information regarding further Load options.

5. APPENDIX

OPTIONAL ACCESSORIES

Listed below are a number of additional components which may be required for an individual installation.

Mating connectors and components for external wiring:

CONNECTOR	DESCRIPTION	ORDER SKU
Mains power	IEC socket 6A	17824103
Audio Input	WAGO 6-pin female	17959146
Network	WAGO 5-pin female	17959145
Failure/Fan or Ext SPL Mic/Temp.	WAGO 5-pin male	17949145

Other installation-related accessories:

DESCRIPTION	ORDER SKU
Intellivox wall bracket, 25 mm	IVX-802235 (2pcs); IVX-802236 (3pcs)
Intellivox hinge bracket 90°	IVX-802000
Intellivox swivel bracket 90°	IVX-806608
Intellivox swivel bracket 45°	IVX-806618
Cover plate with 2 x 13.5 mm cable gland holes	IVX-802110
Cover box, 58 mm, with 2 x 25 mm cable gland holes	IVX-802100

Available input modules:


DESCRIPTION	ORDER SKU
1 x Line Level and 1 x 70V/100V	IVX-381001
Dual 70V/100V with DC blocking	IVX-381005

Network accessories:

DESCRIPTION	ORDER SKU
Program Set (inc. WinControl CD, USB interface, cable)	DUR386612

COMMON ANALOGUE GROUNDING ISSUES

Correctly connecting the Intellivox to ground has several benefits:

1. **Safety.** The GND terminal of the IEC mains connector  provides a direct low impedance path from the metal parts of the chassis to ground. Always connect this terminal.
2. **Reduction of RF emission.** Although the Intellivox electronics module is well shielded and external connections are decoupled to prevent RF emission from the internal high speed digital circuits, this protection will not work properly if the chassis is not connected to ground.
3. **RF Immunity.** RF currents induced in the signal cables by external RF fields are effectively shorted to chassis-ground, provided that the cable screen (shield) is of sufficiently low impedance.

In addition to the mains ground, the Intellivox connector block has ground pins marked in 3 different ways. Each serves a dedicated purpose and care should be taken that they are not interchanged or connected to each other.

- Pins marked GND are connected internally directly to the chassis of the Intellivox. There are GND pins on the audio line input connector and the ambient SPL mic/temperature sensor connector. These GND pins are for connecting the screen (shield) of the audio and sensor cables.
- Two pins marked AGND are fitted to the ambient SPL mic and temperature sensor connector, and serve as a signal reference only. AGND should not be connected to any other ground pin (GND or DGND) on the chassis.
- The RS-485 connector has one pin marked DGND and is intended as a terminal for the network cable screen (shield). Since the RS-485 interface is optically isolated (to prevent ground loops), DGND has no relation to the chassis ground. DGND should not be connected to any other ground pin (GND or AGND) on the chassis.

SOFTWARE AND FIRMWARE UPDATES

The WinControl application is freely available and can be downloaded from our website; <http://www.jblpro.com>. We advise installers, users and engineers to check our site regularly for updates. Intellivox firmware and DSP software upgrades will also be made available through the website.

For further information about how to use WinControl please refer to the WinControl Help files.

NETWORK CABLES

The type of cable necessary for correct operation of the RS-485 network is twin twisted pair with each pair individually shielded. Numerous cables of this type are readily available and cables broadly meeting the specifications of the example cable given below are likely to be suitable.

Example of a preferred cable type:

PARAMETER	VALUE
Type	BELDEN 'Datalene' series No. 9729 2-pair
Characteristic impedance	100 ohms
Capacitance (core to core)	41 pF/m
Capacitance (core to screen)	72.5 pF/m
DC resistance (core)	78.7 ohms/km
DC resistance (screen)	59.1 ohms/km

FAILURE MONITORING ON 70 V/100 V CONNECTION.

If the Intellivox is equipped with an input module that supports direct interfacing to a 70 V/100 V signal, a simple failure monitoring scheme requiring no additional connections can be easily implemented.

This scheme is based on impedance switching of the first 70 V/100 V input. An amplifier that is driving this input should be capable of detecting changes in connected impedance.

Impedance switching is supported for input boards PCB960 (see fig 16) and PCB124 (see fig 17). Configuration details of the impedance switching are depending on the input board type as described hereafter.



Reconfiguring the failure monitoring requires access to an internal jumper.

This requires the electronics module to be carefully removed from the enclosure by a qualified engineer.

Ensure that all connectors are unplugged before removing the electronics module.

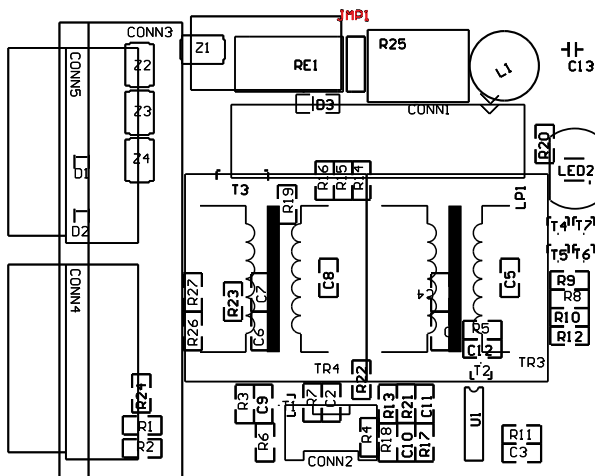


fig.16 - Input board PCB960 with location of jumper JMP1

Configuring PCB960

The impedance between pin 1 and 2 of the audio input connector has two states:

- High impedance (approximately 100 kOhm @ DC).
- Low impedance (approximately 2.2 kOhm @ DC).

The states are switched by a separate change-over contact of the Intellivox's internal Failure Relay.

An internal jumper (JMP1) on the input board determines the impedance states:

- Low impedance if the device status is OK, High impedance if the device has a failure or is not powered. This is the factory default configuration, the jumper is placed on the contact pins of JMP1 that are closest to CONN1 (furthest away from the edge of the board, see fig 16).
- High impedance if the device status is OK, Low impedance if the device has a failure or is not powered. The jumper should be placed on the contact pins of JMP1 closest to the edge of the board.
- Always High impedance, regardless of the device status. The jumper should be removed.

CONFIGURATION	JMP1	NOTES
High-impedance on failure	Towards CONN1	Factory default
Low-impedance on failure	Towards PCB edge	-
Always High-impedance	Removed	-

Configuring PCB124

The impedance between pin 1 and 2 of the audio input connector has two states:

- High impedance (approximately 140 kOhm @ DC).
- Low impedance (approximately 2.2 kOhm @ DC).

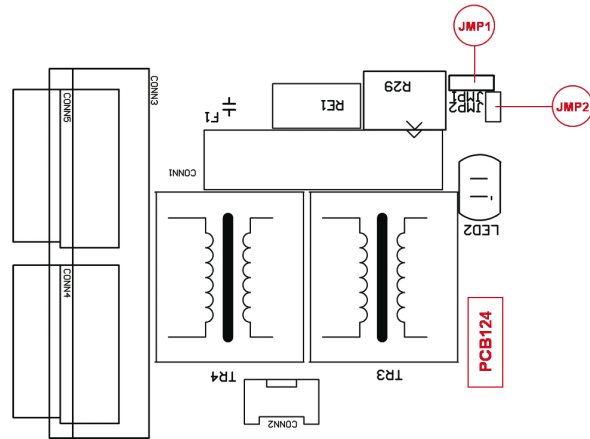
The states are switched by a separate change-over contact of the Intellivox’s internal Failure Relay.

An internal jumper (JMP2) on the input board determines the impedance states:

- Low impedance if the device status is OK, High impedance if the device has a failure or is not powered. This is the factory default configuration, the jumper is placed on both contact pins of JMP2 (see fig 17).
- Always High impedance, regardless of the device status. The jumper should be removed.

Notes

- The fault conditions that result in impedance switching are user definable (these are the same as for the internal Failure Relay, see section Fault Monitoring on page 13 for details).
 - The High impedance state is affected by the option ‘DC blocking’ (as for example offered by part # 381005). In case of the ‘DC blocking’ option, series capacitors result in a very high input impedance for DC. The Low impedance state is not affected by the ‘DC blocking’ option.
- fig.17 - Input board PCB124 with location of jumpers JMP1 and JMP2*



CONFIGURATION	JMP2	NOTES
High-impedance on failure	Present	Factory default
Always High-impedance	Removed	-

FAILURE RELAY CONFIGURATION

Intellivox units equipped with input board PCB124 (see fig.17) support configuration of the internal Failure Relay for either volt-free or impedance-sensing (10k / 20k Ω) operation.



Reconfiguring the internal Failure Relay requires access to an internal jumper.

This requires the electronics module to be carefully removed from the enclosure by a qualified engineer.

Ensure that all connectors are unplugged before removing the electronics module.

An internal jumper on the input board (JMP1) defines the operation:

- Volt-free mode:

In volt-free operation, COM is connected to NC; a failure condition causes COM to be connected to NO. This is the factory default configuration, the jumper is placed on the contact pins of JMP1 that are closest to R29 (furthest away from the edge of the board, see fig 17).
- Impedance sensing mode:

When configured for impedance-sensing use, the impedance between COM and NC is 10k Ω and open-circuit between COM and NO in normal operation. When a fault condition occurs, the impedance between COM and NC rises to 20k Ω , and COM is short-circuited to NO. The jumper should be placed on the contact pins of JMP1 closest to the edge of the board.

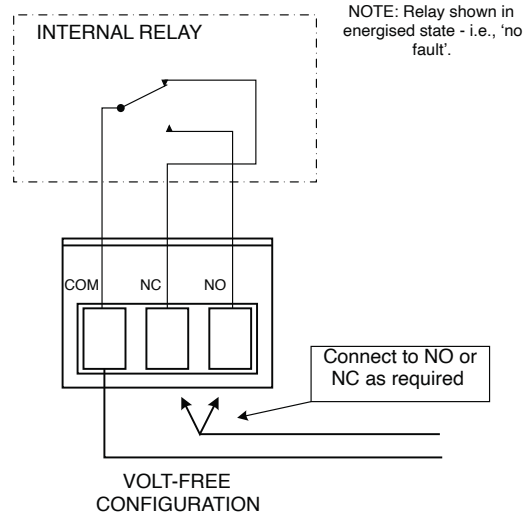


fig.18 - Volt-free mode

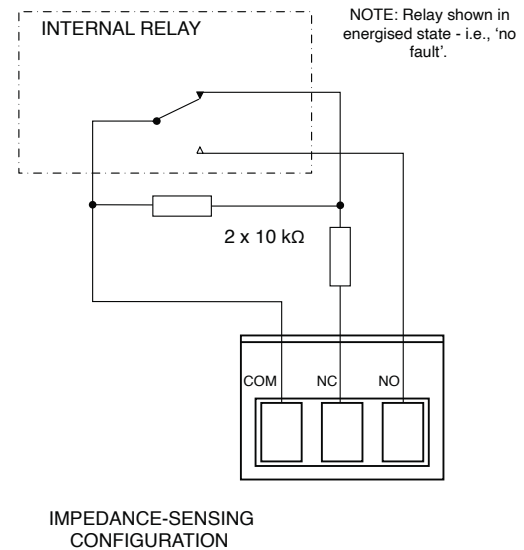


fig.19 - Impedance-sensing mode

CONFIGURATION	JMP1	NOTES
Volt-free	Towards R29	Factory default
Impedance-sensing	Towards PCB edge	-



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