



# 3100

DSP LOUDSPEAKER

INSTALLATION  
AND USER GUIDE

## Important safety instructions

- Read the instructions
- Keep these instructions.
- Follow all instructions.
- Do not use this apparatus near water.
- Clean only with a dry cloth.
- Install only in accordance with manufacturer's instructions.
- Refer all servicing to approved service personnel.

**WARNING: TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS APPARATUS TO RAIN OR MOISTURE**

- Do not expose the speakers to dripping or splashing.
- Do not place any object filled with liquid, such as a vase, on the speakers.
- Do not place naked flame sources, such as lighted candles, on the speakers.

### To avoid interference

Do not position the unit:

- Near strong magnetic radiation.
- Near to a television, or where connecting cables may be subject to or cause interference.

### To avoid overheating

- Leave at least 10cm around the equipment to ensure sufficient ventilation.

Do not position the unit:

- In direct sunlight.
- Near heat sources, such as a radiator.
- Directly on top of heat producing equipment, such as a power amplifier.

### Radio interference

**FCC Warning:** This equipment generates and can radiate radio frequency energy and if not installed and used correctly in accordance with our instructions may cause interference to radio communications or radio and television reception. It has been type-tested and complies with the limits set out in Subpart J, Part 15 of FCC rules for a Class B computing device. These limits are intended to provide reasonable protection against such interference in home installations.

**EU:** This product has been designed and type-tested to comply with the limits set out in EN55013 and EN55020.



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## Copyright and acknowledgements

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### Designed, manufactured in the UK

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## About your Meridian DSP loudspeakers

These instructions provide information about unpacking, connecting up, configuring, and using your Meridian 3100 DSP loudspeakers. They apply to the DSP3100 left and right loudspeakers, and the DSP3100HC horizontal centre loudspeaker.

### Introduction

Meridian DSP loudspeakers represent the fruits of more than 25 years of continuous development of loudspeakers as musical instruments. The finest materials and state-of-the-art design are combined to create what we believe is the ultimate range of home loudspeakers.

### Digital Signal Processing

Digital Signal Processing, or DSP, is a technique pioneered by Meridian in hi-fi products for achieving extremely accurate reproduction of audio signals using high-precision mathematical processing.

DSP allows sophisticated processing to be performed without any of the cumulative noise or degradation that inevitably occurs, even with high-quality analogue circuitry. In addition, the signal improvement techniques incorporated in the Meridian DSP loudspeakers would be virtually impossible to implement in the analogue domain.

If you are using the Meridian DSP loudspeakers with a digital source, such as CD or DVD, the signals remain in digital form until the last possible stage.

### Power amplifiers

The speakers are driven by multiple independent high-power, low-feedback power amplifiers. The combination of idealised magnetic design, careful star earthing, and very fast output devices gives the amplifiers extremely low noise, high detail, and fast bass.

The whole electronic assembly is supplied from substantial toroidal transformers feeding high-quality, audiophile-grade capacitors.

### Meridian Comms

Meridian DSP loudspeakers are part of the Meridian family of advanced digital, analogue, and video components, and these incorporate a sophisticated communications link, to allow you to control any combination of units using a single remote, and ensure that they will work together as a fully integrated system.

## Unpacking your speakers

Before you begin installation you should ensure that your DSP loudspeakers are the correct voltage for your local AC supply. If they are not, do not try to install them, and contact your dealer.

You should not make any connections to the DSP loudspeakers, or to any other component in your system, while the AC power supply is connected and switched on.

### Components

Each DSP loudspeaker system is supplied with the following components:

- One power cord per speaker.
- Meridian M5 lead (8m).
- Meridian S5 lead (8m).

If any of these items is missing please contact your dealer. We suggest that you retain the packaging carefully for maximum protection in transit.

### Removing the grilles

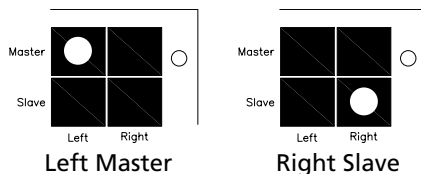
DSP3100: The grille is held tightly in place by the side metal plates. Gently pull it from the top edge, taking care not to scratch the high-gloss lacquer, then pull it gently from the sides and then bottom to remove it.

DSP3100HC: The grille is held on by pegs. Gently pull from the sides and then top and bottom to remove it.

**Note:** The speakers are designed to be used with their grilles fitted.

### Master and slave

When two 3100 loudspeakers are supplied as a pair, one speaker is preconfigured as Left Master and the other as Right Slave. This allows you to set up a 2-channel system without any further configuration:



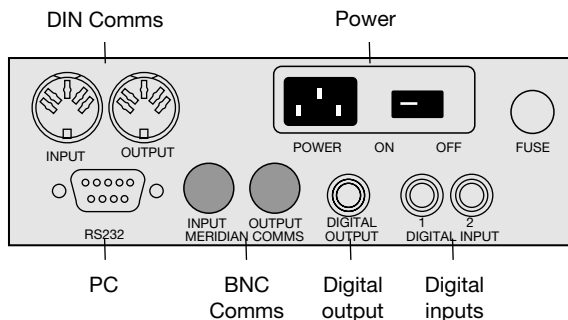
### Cleaning the speakers

Greasy marks should be removed from the metal surfaces by light rubbing with a slightly damp cloth and a trace of proprietary glass cleaner. Do not use any other solvent or abrasive based cleaners.

On black speakers, small marks on the lacquer surface can usually be removed by treating with Black Turtle Wax Color Magic. Do not use any coarse polish such as Auto Colour restorer, and always test any polish on a non-visible area first. Do not use any polish containing a solvent; these can cause crazing of the surface.

## Connections

The following diagram gives details of the back panel connections:



See overleaf for pictures of sample configurations.

## Digital connections

The following table gives details of the digital audio connections:

Use this connection	To connect to this
DIGITAL INPUT 1, DIGITAL INPUT 2	A digital source, such as a digital sound processor, digital preamplifier, CD player, or DVD player
DIGITAL OUTPUT	A second (slave) DSP loudspeaker, using an S5 lead.

The digital connections should be made with high-quality 75Ω screened cable. Suitable cables are available from Meridian. We do not recommend using analogue audio cables, which do not have adequate shielding or the correct impedance, or cables intended for UHF applications, as these do not provide adequate shielding in the 1–30MHz region.

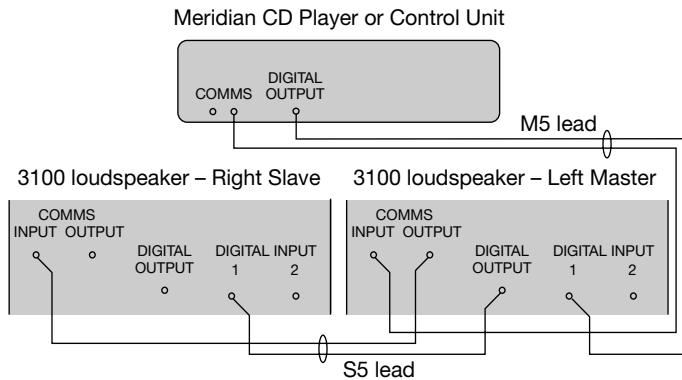
## Communications connections

The following table gives details of the communications connections:

Use this connection	To connect to this
COMMS INPUT	The COMMS connection on a Meridian control unit or preamplifier.
COMMS OUTPUT	The COMMS INPUT on a second DSP loudspeaker.
RS232	The serial port of a PC, to control the DSP loudspeaker using a computer. For more information see the Meridian Web site, <a href="http://www.meridian-audio.com">http://www.meridian-audio.com</a> .

The DIN Comms and BNC Comms connections are equivalent; use whichever is appropriate for the leads supplied with your other Meridian equipment.

## Connecting two 3100 loudspeakers to a Meridian CD Player, Control Unit, or other digital source



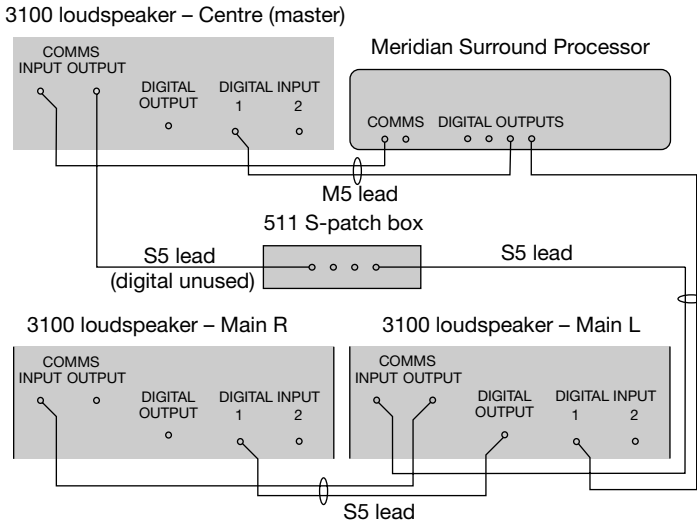
You can create a complete system by connecting a pair of 3100 loudspeakers directly to a digital source. The 3100 loudspeakers include volume, balance, and tone controls allowing you to control the system using an MSR+ (not provided).

Because the 3100 speakers are preconfigured for use in a two-channel system, no further configuration is necessary.

- Connect the DIGITAL OUTPUT and a COMMS socket from the Meridian source or control unit to DIGITAL INPUT 1 and the COMMS input on the DSP loudspeaker labelled Left Master, using the M5 lead supplied.
- Connect the DIGITAL and COMMS outputs from the master DSP loudspeaker to DIGITAL INPUT 1 and the COMMS input on the DSP loudspeaker labelled Right Slave, using the S5 lead supplied.

You can connect another digital source to DIGITAL INPUT 2, and then configure the appropriate source selection key on the remote to select that input.

# Connecting three or more 3100 loudspeakers in a Meridian surround system

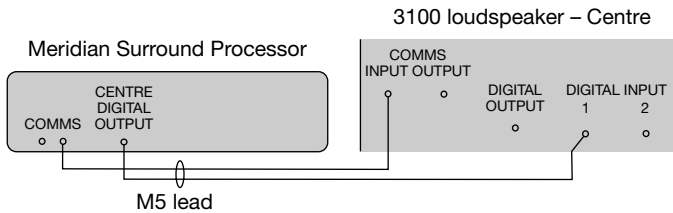


If your system includes more than two Meridian 3100 loudspeakers you will need a 511 S-patch box (available separately) to link together the S5 leads from each speaker, as shown above. **Note:** This does not apply to the 861, which includes a built-in patch box.

- Use the comms part of an M5 lead to connect one of the COMMS sockets on the Meridian Surround Processor to the 3100 loudspeaker you have chosen as the master (typically the centre speaker).
- Use the audio part of the M5 lead to connect the 3100 loudspeaker to the appropriate digital output on the Meridian Surround Processor.
- Connect the COMMS output from the master 3100 loudspeaker to one socket on the 511 using an S5 lead.
- Link all the other 3100 loudspeakers together in pairs using S5 leads, as shown in the illustration.
- Connect each pair of 3100 loudspeakers to the appropriate digital output on the Meridian Surround Processor, using an S5 lead. The other part of the S5 lead is used to distribute the COMMS from the 511 to each pair of DSP loudspeakers.

You will then need to configure the master speaker as described in the section *CONFIGURING* overleaf.

# Connecting a 3100 loudspeaker as a centre speaker



You can use a single 3100 loudspeaker as a centre speaker in a Meridian surround system.

- Connect the speaker to the CENTRE digital output using an M5 lead, as shown in the illustration.

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## Specifications

### Digital inputs and outputs

- 2 x cable inputs, 32–96kHz. FIFO locks at 44.1, 48, 88.2, or 96kHz  $\pm$ 150ppm.
- PCM using IEC958, or MHR connection support with auto-detection.
- 1 x 24-bit Multi-bit delta-sigma DACs with 128x oversampling.

### Signal processing

- 1 Motorola 56367 running at 150MHz.
- 3 x 24-bit Multi-bit delta-sigma DACs with 128x oversampling.
- Crossover linear-phase  $\pm$ 30° at 2.6kHz.

### Output stages

- Power amplifiers: Complementary bipolar design, with output-stage error correction and twin loop design.
- Bass/Mid: 75W.
- Tweeter: 50W.

### Acoustic

- DSP3100: 2 way, vented box; DSP3100HC: 2½ way, closed box.
- DSP3100: 1 x 160mm (6.5"); DSP3100HC: 2 x 120mm (5.25"); doped carbon fibre high-efficiency long-throw drivers.
- Treble drive unit: 1 x 25mm (1") Meridian piston doped fabric dome.

### Characteristics

- Distortion typically <0.01%, or <0.02% up to full power at all frequencies.
- Noise and hum <-94dB at all volume settings.
- Acoustic output typically >111dB spl @ 1m.
- Acoustic noise <15dB spl @ 1m.
- Frequency response in room response within 3dB, 45Hz-20kHz.

### Control

- 2 x Meridian Comms.
- 9-pin D connector for RS232 PC control, null modem, 9600 baud, 2N1, no HS.

### Cabinet

- Bonded aluminium panels.
- MDF cloth-covered grille.
- Silver/black finish.
- DSP3100: 194 x 386 x 254mm (7.65 x 15.2 x 10") (W x H x D), 12kg (27lb).
- DSP3100HC: 470 x 174 x 254mm (18.5 x 6.9 x 10") (W x H x D), 15kg (33lb).

### Power

- 100-125; 200-250V AC 50-60Hz.
- 20VA standby; 600VA max.

Meridian Audio reserves the right to amend product specifications at any time.



## Choosing a standard setting

Unless you are using a pair of 3100 loudspeakers in a 2-channel system, you will need to configure them as described in this section.

The DSP loudspeakers provide the following five alternative standard settings, called Types, which configure all aspects of the DSP loudspeakers into the most commonly needed configurations:

Type	Description
1	Selects D1 for all sources. For use with a stereo system; eg a CD or DVD player such as the G08 or G91.
5	For use with a CD player connected to D1; all other sources use D2.
6	For use with a Meridian Surround Controller.
7	For use in a second room.
8	For use in the second or third room of a three-room system.

Types 2, 3, and 4 are for compatibility with 200/600 series units.

In all cases except Type 5, the D1 input is used for all sources.

Choosing one of the standard settings overrides any other configuration you may have performed, and so can be used to reset the configuration of the speakers.

### To select a standard setting

- Switch off the DSP loudspeaker.
- Turn on the power again while holding down the key on the remote corresponding to the Type you want to use.

The display will show the Type number. For example:



- Release the remote key. The display shows:



- Press ▲ or ▼ to specify the speaker position from the following options:  
L.: Left ,R.: Right, C.: Centre, S.L.: Left surround, S.R: Right surround.

You should then select one loudspeaker to be the master; this will normally be the centre channel. Each other 3100 loudspeaker should be configured as a slave as follows.

- Press the green ► (Play) key on the remote.  
For example:



Alternatively you can configure the speaker as a slave, with the D2 input used for all sources, as follows:

- Press the green ► (Play) key on the remote repeatedly until the display shows:



When you have configured the loudspeaker:

- Switch off the 3100 loudspeaker, using the power switch on the back, and then switch on again to restore normal operation.

## Custom configuration

This mode allows you to check or alter the individual settings defined by the standard Type settings.

- Turn off the DSP loudspeaker, using the power switch on the back panel.
- Turn on the power again while holding down the 0 key on the remote.

The display will show the current setting of the first configuration option.

- Press ► or ◀ to step between the options.
- Press ▲ or ▼ to change the value of the current option.

The table below shows the options you can configure:

Option	Initial value in Type 1
Position and master/slave	L.
Compatibility (G, 500, 200 Pre, or 200 CD)*	G.
Controller mode (Auto, Con, or NCon)	Auto.
System address (1–8)	S.A. 1
Diagnostic displays? (N or Y)	Diag. N
Product address (1–8)	P.A. 1
Volume mode (1=normal, 2/3=second/additional room)	L.E. 1
Balance control? (N or Y)	Bal. Y
Centre menus? (N or Y)	Centre menus? (N or Y)

\* G gives 500 Comms and MSR+ sources, 500 gives 500 Comms and MSR sources, and 200 Pre or 200 CD are legacy modes.

## Configuring sources

The 3100 loudspeakers provide 12 sources corresponding to the 12 source selection keys on the remote: **CD, RADIO, DVD, AUX, DISC, TAPE, TV, CABLE, SAT, VCR1, VCR2, and GAME.**

You only need to configure the sources on the 3100 loudspeaker you have specified as the master.

While in configuration mode:

- Press the source key on the remote corresponding to the source you want to configure.

For example, to configure the Radio source the display initially shows:



- Press ► or ◀ to step between options.

The right-hand set of characters shows the current value of the option.

- Press ▲ or ▼ to change the value of the option.

The options are summarised in the following table:

Option	initial value	Alternatives	Explanation
Label	Radio	CD, Radio, LP, etc.	The label used to identify the source on the front panel display.
Audio input	D1	D1 or D2.	Choose D1 or D2 to specify the input.
Comms type	2C	1C – 9C, or NC.	Choose 1C for a Meridian CD player, 2C for a Meridian FM Tuner, 3C for a Meridian DVD player, or NC otherwise.
Address	1A	1A – 8A.	Allows you to have up to eight of type.
FIFO	FF. Y	Y or N.	Choose N to disable the FIFO buffer if you have difficulty locking to a poor source.

When you have finished programming sources:

- Switch off at the back panel, and then switch on again to restore normal operation.

## Configuring the frequency response

The setup options allow you to adjust the frequency response of the loudspeakers to compensate for their position. You only need to configure the master loudspeaker.

- Turn off the DSP loudspeaker using the power switch on the back panel.
- Turn on the power again while holding down the **Store** key on the remote.

The display will show:

A black rectangular display showing the word "Setup" in a white, pixelated font.

It will then revert to standby:

A black rectangular display showing a white hash symbol "#".

You can now operate the speaker in the usual way, using the additional setup menus to adjust the response while listening to sources.

- Press **Function** ► or **Function** ◀ until the display shows the current response setting. For example:
- Press **Function** ▲ or **Function** ▼ to select the appropriate option as follows:

A black rectangular display showing the word "Free" in a white, pixelated font.

Option	What it means
Free	Flat frequency response.
Boundary	Speaker closer than 0.5m (20") to a wall.
Sub.1	Applies a second-order high-pass filter at 80Hz for use with an analogue subwoofer.
Sub.2	Applies a second-order high-pass filter at 120Hz for use with an analogue subwoofer
Corner	Speaker closer than 0.5m (20") to a corner.

If your system includes a DSP centre speaker you should set **Centre Y** on the master speaker. An additional frequency response option is then provided to allow you to adjust the centre speaker, with the equivalent options: **C.Fre**, **C.Bou**, **C.Sb1**, **C.Sb2**, and **C.Cor**.

An additional centre tilt offset option is also provided. The centre tilt offset is added to the treble value for the selected source. The recommended setting is -1dB when the speaker is positioned above a television.

Once you have adjusted the frequency response for the speakers in your system you should store the settings using the following procedure:

- Press **Function Store**. The display shows:

A black rectangular display showing the word "Store" in a white, pixelated font.

- Turn off the DSP loudspeaker using the power switch on the back panel.

When you turn on the power again the speaker will operate normally with the frequency response settings you have stored.

## Using the DSP loudspeakers as a control unit

In systems with a Meridian preamplifier or control unit all of the functions of the DSP loudspeakers, including volume, treble, and bass, are operated via the controller. For more information refer to the user guide for the preamplifier or control unit, and you can ignore this chapter.

The DSP loudspeakers can also be connected directly to up to two digital sources to create a complete, minimum system. This chapter provides step-by-step instructions for operating the DSP loudspeakers in a system with no Meridian preamplifier or control unit.

## Switching on and selecting a source

When not playing, the DSP loudspeakers should be left in the standby state. This uses a negligible amount of electricity, but ensures that the components of the loudspeakers operate at maximum efficiency from the moment you start.

If you are not going to use the DSP loudspeakers for several days you should switch each unit completely off at the back panel, and disconnect it from the AC power supply.

### To select a source

- Press the appropriate source key on the remote; eg **Radio**.

This will bring the DSP loudspeakers out of standby, and the displays will show the currently selected source and volume setting.

For example:



By default the 12 sources are available.

As standard, all the sources are set to select the D1 digital input.

### To switch to standby

- Press **Off** on the remote.

The loudspeakers will switch to standby and the displays will show:



## Changing the display

The DSP loudspeakers display information about the current settings on the 8-character front-panel display.

In addition, three coloured indicators show status information.

### To change the displayed information

- Press **Display**.

Pressing **Display** steps between the options: Source and volume, Meridian source display (dashes if not present), Audio format, and Blank.

The audio format display shows PCM, Data, or MHR followed by the frequency, or NL (not locked).

### Status indicators

The display includes the following status indicators: Red: Master loudspeaker, Yellow: 88kHz or 96kHz input, and Green: Clipping.

## Adjusting the volume

### To change the volume

The DSP loudspeakers adjust the volume in precise steps of 1dB, where 9dB is equivalent to doubling the loudness, and can be varied in the range 1 to 99dB.

When you first connect power to the DSP loudspeakers the volume is set to 65, which is similar to the midway position of the rotary volume control on a conventional preamplifier.

- Press the red ▲ or ▼ keys on the remote.

As you adjust the volume setting the display will show the current volume level. For example:



### To silence or restore the sound

- Press **Mute** on the remote. The display will show:



## Adjusting the sound

### To change the treble or bass

The 3100 loudspeakers provide sophisticated treble and bass controls, to allow you to adjust the broad balance of the system to correct for the acoustics of your listening room, or for a misbalanced recording.

The controls are more subtle than conventional tone controls, and take advantage of digital signal processing techniques to provide a more natural adjustment of the frequency response.

- Press **Function** ◀ or **Function** ▶ until the display shows the current treble or bass.
- Press **Function** ▲ or **Function** ▼ to change the treble or bass.

The treble control tilts the frequency of the response over the entire frequency range to make the sound brighter or dimmer. It can be adjusted between  $\pm 10\text{dB}$  in 0.5dB steps. Normally settings between +1.0 and -2.0 will give the most natural results.

The bass control allows you to adjust the bass response in the room by  $\pm 5\text{dB}$  in 0.5dB steps. Normally settings between +3.0 and -2.0 will give the most natural results.

### To change the absolute phase

You can change the absolute phase of the signal, to compensate for signals which are out of phase, giving an unnatural-sounding bass.

- Press **Function** ▶ or **Function** ◀ until the display shows the current phase.
- Press **Function** ▲ or **Function** ▼ to change the phase.

### To change the balance or axis

The balance control of the DSP loudspeakers uses digital signal processing to compensate for an off-centre listening position by delaying and diminishing the sound in one speaker, thus effectively shifting the speaker's image back.

The axis control allows you to adjust the optimum listening height of the DSP loudspeakers, like a balance control operating in the vertical plane.

- Press **Function** ◀ or **Function** ▶ on the remote until the display shows the current balance or axis.
- Press **Function** ▲ or **Function** ▼ to change the balance or axis.

The display shows the direction and position of the listening position.

There are 32 balance steps in each direction.

The axis can be adjusted between 3 and -2, where 0 corresponds to the axis of the treble unit. Usually a listener will be below that position, so we recommend settings of -1 or -2.

## Troubleshooting

### Display on front panel not lit

Check the following:

- There is AC power connected to the socket on the back of the 3100 loudspeaker.
- The power switch on the back panel of the 3100 loudspeaker is turned on.

If the display will still not illuminate, check any fuses in your power supply and the fuse in the inlet of the 3100 loudspeaker. If these are all intact, contact your dealer.

### Remote not working

Check the following:

- The battery in the MSR+ remote.
- See if the 3100 loudspeaker has been set up as not controller in the Meridian Configuration program. **Note:** This may be deliberate by your dealer.

### Unit goes silent when played hard and displays 'Hot'

The 3100 loudspeakers have a temperature sensing system on board, which prevents overheating of the electronics. The sound will continue when the speaker has cooled.

### There is radio interference

The 3100 loudspeaker is a digital audio and computing device which has been designed to very high standards of electromagnetic compatibility.

If this equipment does cause or suffer from interference to/from radio or television reception then the following measures should be tried:

- Reorient the receiving aerial (or antenna) or route the antenna cable of the receiver as far as possible from the DSP loudspeaker and its cabling.
- Ensure that the receiver uses well-screened antenna cable.
- Relocate the receiver with respect to the DSP loudspeaker.
- Connect the receiver and this product to different AC outlets.
- If the problem persists contact your dealer.

### Drive units move when the speaker is switched on or off

This is normal as the speaker active electronics settle.

### Configuring the 3100 loudspeaker does not have any effect

Make sure that you are configuring the 3100 loudspeaker used as the master digital loudspeaker in the system. This determines the configuration of all digital loudspeakers in the system.

### Unit stays in standby

- Check that it is connected correctly.
- Turn the system on from another Meridian product in the system.

### Only the master loudspeaker plays

- Check the S5 cables are connected correctly.

### Sound is odd or mono

- Check that the 3100 loudspeakers are correctly configured as Left and Right respectively.

### The green indicator flashes or stays on

This indicates that 3100 clipping is occurring.

Brief flashes indicate occasional clipping which will not be audible.

If the indicator stays on for long periods this may indicate a fault in the configuration of your system, and you should contact your Meridian dealer.