SYSTEMLINE MODULAR PLANNING GUIDE

Systemline

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Terminology

This guide uses the following terminology to refer to the components of the Systemline Modular system:

Multi-room system: An audio or audio-visual system that can be used in any room in the home. Sometimes colloquially referred to as a *built-in sound system* or *distributed audio system*.

Zone: A location or room remote from the hi-fi system. With Systemline Modular, this would typically consist of a pair of Systemline Modular ceiling speakers and an optional wall mount keypad, allowing audio to be played either from the remote hi-fi system or from a local source.

Main zone: The principal zone from which sub-zones are fed. Also called *Prime zone.*

Sub-zone: A zone which shares the same audio source as a main zone but with independent volume control.

Expanded zone: A zone where multiple active speakers are used to distribute sound over a large area, usually with synchronised volume control. An expanded zone can also be configured with two or more areas of independent volume control (via separate keypad control).

Multi-source multi-zone: A system where different audio sources can be played in different rooms simultaneously.

System room: The location of the hi-fi system providing the audio sources to be distributed via Systemline Modular.

Hub: A Systemline Modular component that distributes audio and infra-red signals to multiple zones. This component must be used for all systems consisting of more than one zone.

Local input: Each zone or sub-zone can accept a local stereo audio input. This input can **only** be listened to in that zone, hence the term *local*. The actual location of the audio source need not be local, it could be in another room or other discreet location.

About this guide

This *Systemline Modular Planning Guide* is a companion to the *Systemline Modular Installation Guide*, and is aimed at audio installation engineers, qualified electricians, executive home-builders, and architects involved in the planning of a multi-room audio installation in a residential property.

It consists of the following chapters:

Introduction gives a general overview of the Systemline Modular multi-room system, with a description of its main features and benefits.

A simple one-zone system shows how to configure a simple single zone system using the components described in the previous chapter.

Planning a multi-zone system describes how a multi-zone Systemline Modular system is configured. It also provides detailed diagrams and a wiring schedule showing how such a configuration can be specified.

Installation guidelines provides installation guidelines, which should be read and understood before commencing specifying or wiring the installation.

Advanced configurations illustrates the flexibility and scalability of the system.

Finally, **Technical specifications** gives details for each of the components of the Systemline Modular System.

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1 Introduction

This chapter gives a general overview of the Systemline Modular multi-room system, with a description of its main features and benefits.

1.1 What is Systemline Modular?

Systemline Modular is a completely new concept in built-in multi-room audio systems. It has been designed for very high-quality music distribution throughout the home, using standard Category-5/6 (CAT5, CAT6) networking cable, and without the need for additional specialist loudspeaker and audio cables.

The system is based on intelligent in-wall or in-ceiling active speakers that provide all the amplification and control needed by the system. The system can be controlled either via in-wall keypads or by elegant infra-red remote handsets.

Systemline Modular is very flexible and highly scalable. Future product releases will provide multi-source capability (that is the ability to listen to different music sources in different rooms). Check our web site www.systemline.co.uk/modular for the latest information.

1.2 Key features

Standard wiring

One of the most attractive features of Systemline Modular, from an installer's perspective, is the use of CAT5 UTP cable throughout. This carries power, control signals, and left and right-channel balanced line audio. It is therefore very easy and extremely cost-effective to pre-wire an installation in a new property, using standard tools, materials, and techniques that would be familiar to all electricians and engineers.

First class hi-fi sound reproduction and high noise immunity

Systemline Modular uses the professional balanced line standard for transmitting audio. This ensures almost perfect signal transmission and provides high immunity to noise and electromagnetic interference.

Energy efficient design

Systemline Modular uses an extremely energy efficient design, so when in use, or in standby, it will not be wasting electricity. A secondary, but very important result of this, is extremely cool running. No special provision needs to be made for ventilation when installing this system.

Sophisticated interconnectivity of modular components

Systemline Modular offers unprecedented flexibility, whilst still maintaining full interconnectivity. The system knows what each of its component parts is doing, including its exact status. For example, if a ceiling speaker receives a command to switch to a local input, it will change its display accordingly. It will also tell the keypad in that zone to do the same.

Ease of installation, fail-safe protection, and rugged reliability

All connections to loudspeakers, keypads, and wall sockets are via Katts type 110 punch-down connections. This not only offers easy termination, but also a very quick way to correct a wiring error. Furthermore, if a wiring error is made, Systemline Modular is extremely well protected and is unlikely to be damaged by accidental incorrect termination. All Systemline Modular products have been designed to be as reliable and rugged as possible.

Space efficiency

In just about any home, the last thing that anybody wants is clutter. Systemline Modular uses high efficiency Class D amplifiers incorporated into the speaker, eliminating the need to accommodate large amplifier boxes. The only product that takes up any significant space is the hub, and that only measures 145 x 130 x 40mm, about the frontal area of a single CD case!

Control options

Systemline Modular can be controlled either by an infra-red handset or wall-mounted keypad. Some models of the active speaker have built-in infra-red receivers, and so do all keypads. The system includes an infra-red relay, allowing third-party hi-fi equipment to be controlled from any of the zones or sub-zones using the manufacturer's original remote control.

1.3 Systemline Modular components

This section briefly describes each of the Systemline Modular components.

Active loudspeakers – ALM2/SLM2

ALM2: Active Loudspeaker Modular size 2 (pair) – consists of one SLM2 active speaker and one PSM2 passive speaker.

SLM2: Single mono active Loudspeaker Modular size 2.

Every Systemline Modular multi-room system will contain at least one active loudspeaker. The speaker drive units are carefully matched to a high efficiency class D amplifier specified to deliver first class quality hi-fi sound. Connection by a single run of CAT5/6 cable conveys power, data, and balanced line stereo audio. However, we normally recommend running at least two CAT5/6 cables.

The active speaker can be used alone in mono mode (just by flipping a switch) or with a partnering passive speaker for stereo use. Each active speaker can be adjusted to turn on at the volume level of choice, and to limit the maximum volume (great for kids' rooms!). Bass and treble equalisation can also be set to compensate for compromised speaker placement, or to allow for personal taste.

Installation tip: Listening levels in dining rooms are normally quite low, therefore a slight treble and bass boost may be appropriate.

Infra-red remote control – RM1

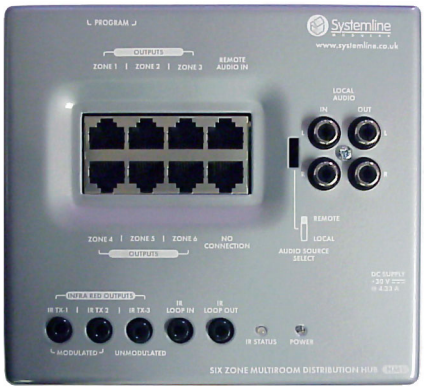
A stylish anodised aluminium infra-red remote control handset for use with either infra-red enabled speakers or via a KPM1 keypad. It turns zone on/off, increases/decreases volume, mutes the zone and allows selection of local input.

Keypad – KPM1

The wall-mounted keypad fits in a standard (44mm) deep single-gang back box. It turns the zone on/off, increases/decreases volume, and allows selection of local input.

The keypad module is available in white and black, with a wide variety of optional snap-on metal faceplates including satin-nickel, black chrome, polished chrome, and brass.

Single source 6-zone hub – HM1



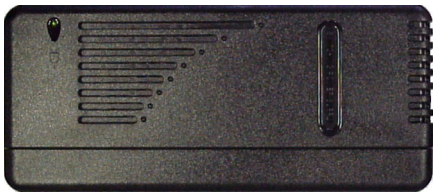
The hub is required for all installations featuring two or more zones. It is designed to be screwed to the wall in an unobtrusive place, such as an under-stairs cupboard using the supplied mounting brackets. Alternatively it can be enclosed within a structured wiring box such as those offered by On-Q, Open House, or RW Data (Home Cabling). Various adaptor brackets are available to fit such enclosures.

The hub has inputs for a power supply and direct audio input. It also has a balanced line audio input for the connection of a remotely located hi-fi system or music source (normally located in the system room) together with IR, power, and audio routing to each zone.

Each hub can drive six zones and 12 sub-zones (sub-zones require separate power supplies). It is possible to expand the system to up to 18 zones and 32 sub-zones by adding additional hubs. This is easy to implement if the hi-fi system or music source is connected to the direct audio input on the hub. However, if the music source is located remotely, then a special wiring configuration is required. For more information see *Advanced configurations*, page 15.

Note: The multi-source hub will be able to drive a maximum of 8 zones and 16 sub-zones

Power supplies – PSM130/PSM45



PSM130 (shown above): 130W power supply.

PSM45: 45W power supply.

Two power supplies are available for use with Systemline Modular. The 130W model is a switched mode supply with fan cooling, and this should be used with the hub to service up to six zones. The 45W power supply should be used for single zone and sub-zone applications. Mounting brackets are available separately for each power supply.

Note: Use of any other power supplies invalidates the Systemline Modular guarantee.

Line-level source input module – SIM

The line-level source input module is designed to fit into a standard single-gang (44mm) deep back box, and converts between line-level RCA phono inputs to balanced line audio over CAT5/6 cables, as required by Systemline Modular. A separate pair of RCA phono outputs is provided to allow the audio to be looped back into the hi-fi system if required.

Infra-red output module – IRM

The infra-red output module is designed to fit into a standard single-gang (44mm) deep back box, and it permits infra-red commands picked up by the ceiling speaker or keypad to be routed back to the system room so that a hi-fi system can be controlled from any zones.

There are two modulated outputs, which are used in conjunction with devices called *window emitters*. These stick onto the infra-red receiver window of each hi-fi component and allow all infra-red commands from any zone to be *repeated* for the hi-fi component to act on.

The unmodulated infra-red output can be connected directly to an infra-red input socket provided on some devices. This is often referred to as a hard-wired connection. The fourth socket is reserved for future use.

CIM option – CIM

The SIM and IRM can be supplied to fit together into a double-gang back box. The part number for this combination is **CIM**.

Power Input Module – PIM

The power input module is designed to fit into a standard single-gang (44mm) deep back box. It is used in conjunction with a PSM45 power supply to power a single zone system or sub-zone.

1.4 Specifying a multi-room system using these components

The rest of this manual describes how these devices can be used together to create a very flexible and scalable multi-room system. Several starter packages are available, which make it very easy to specify a complete multi-room system.

Features and specifications

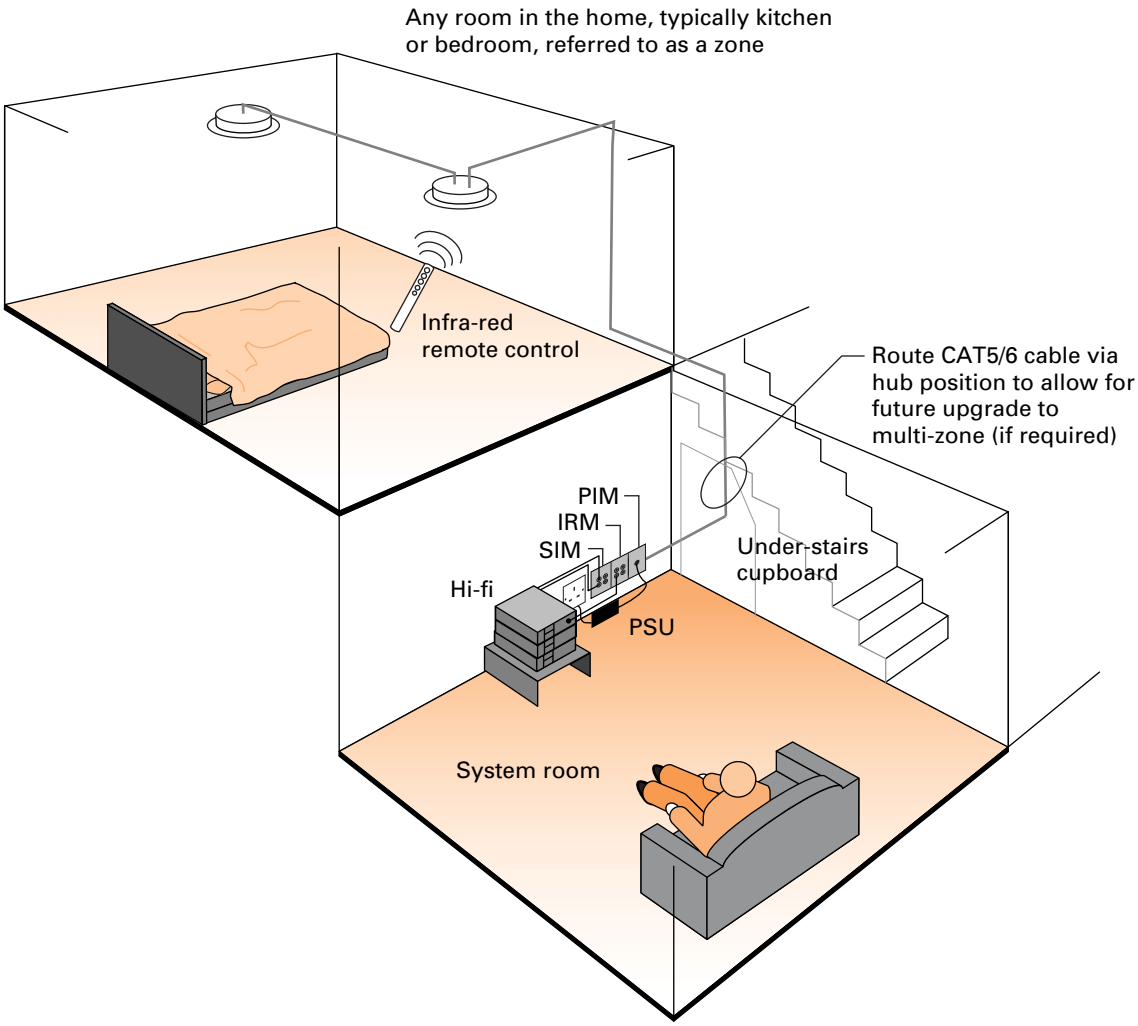
For detailed features and product specifications, please see *Technical specifications*, page 17.

2 A simple one-zone system

This chapter shows how to configure a simple single zone system using the components described in the previous chapter.

2.1 Overview

Creating a one-zone system is simply a case of running one CAT5/6 cable from one location to the next. The following diagram illustrates this in practice. A keypad and local input can be added if required.



The diagram shows how simple it is to configure a single zone system, however most installations will be multi-zone.

For cable runs of up to 40m the silent PSM45 may be used. For cable runs of 40 to 50m the fan-cooled PSM130 should be used.

3 Planning a multi-zone system

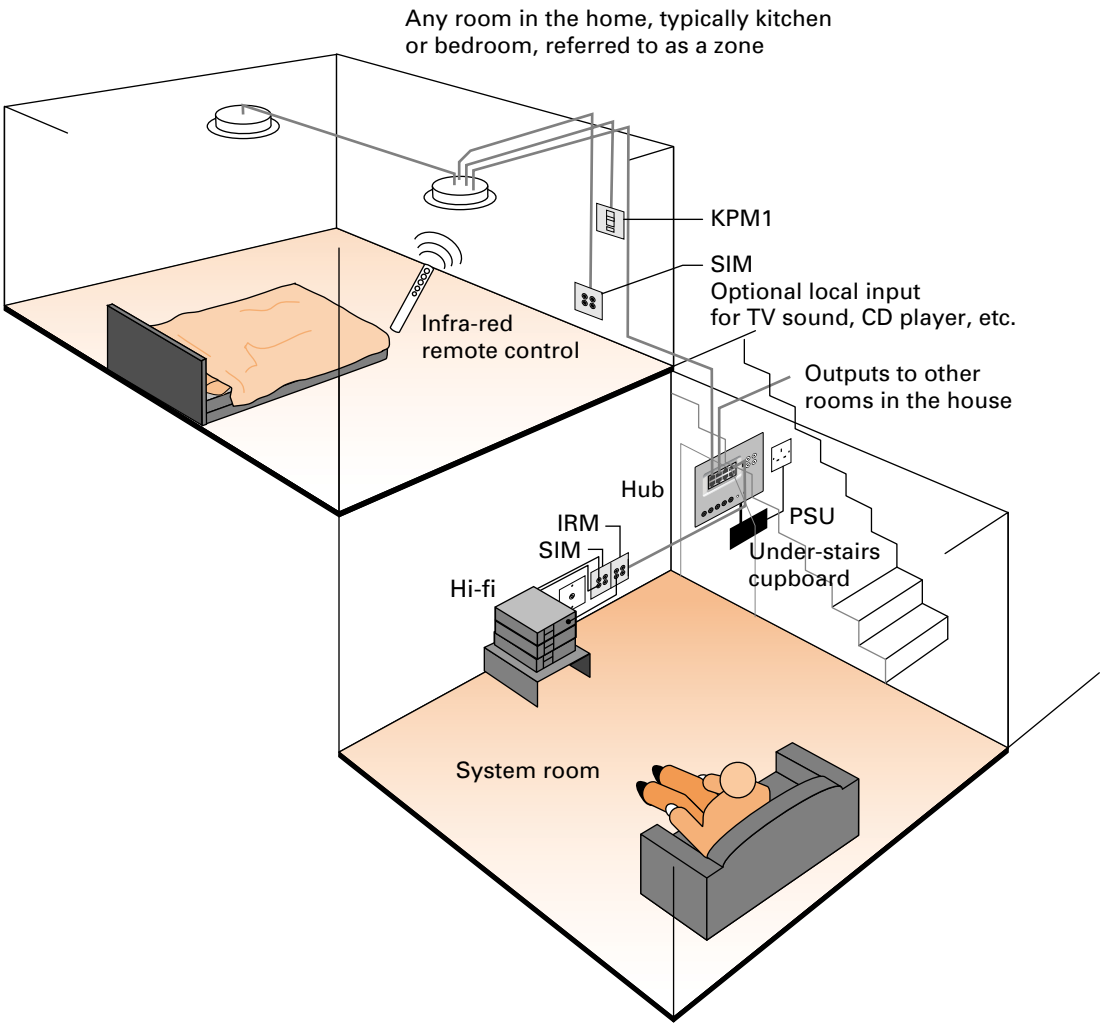
This chapter describes how a multi-zone Systemline Modular system is configured. It also provides detailed diagrams and a wiring schedule showing how such a configuration can be specified.

3.1 Overview

As this example is for two or more zones, it features an HM1 hub. This example could be specified on a pre-wiring basis so for a new-construction, a template wiring scheme could be devised for future use by the eventual purchaser of the home. It can also be used as the starting point for a completely bespoke installation.

Note: Many executive home builders are now looking to specify fully operational ready to use installations, so it is important that the end customer is able to easily upgrade the system.

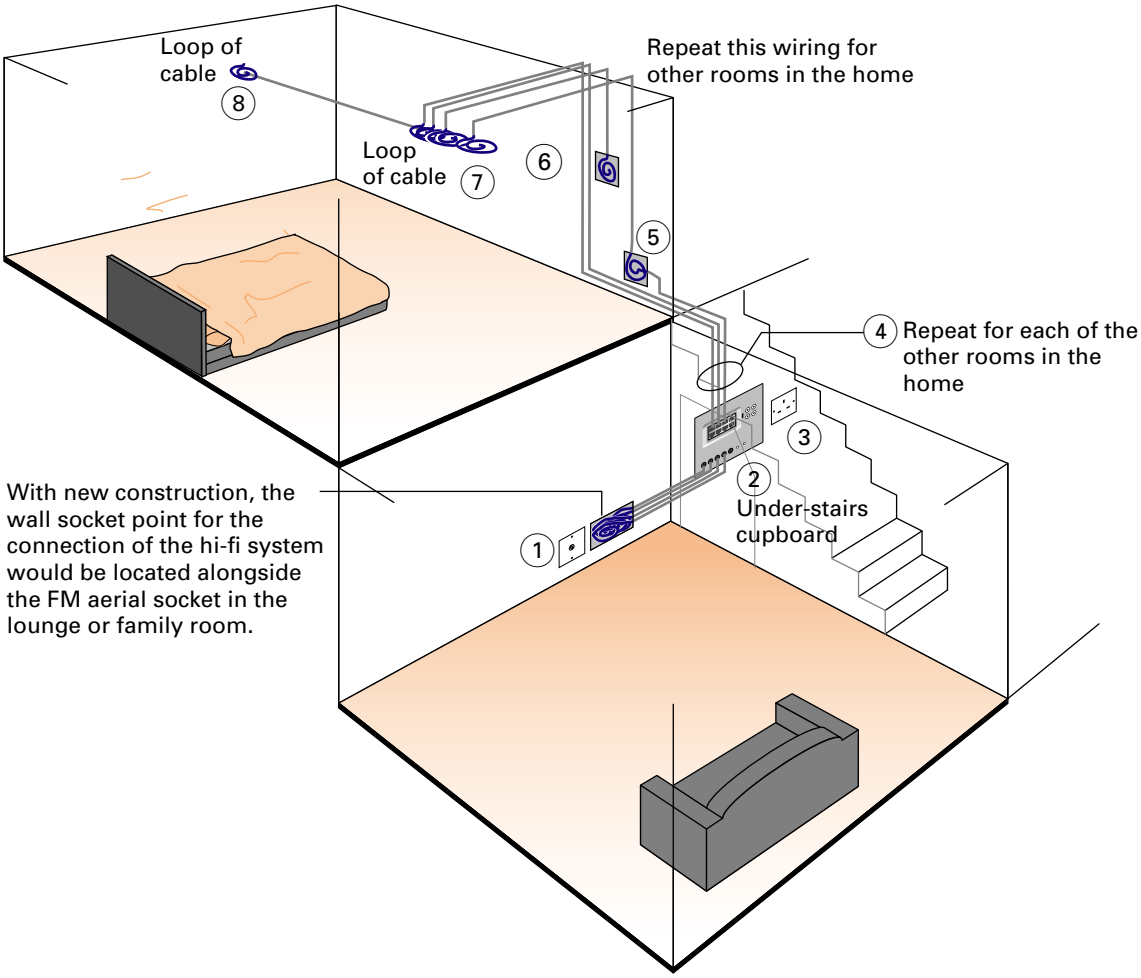
The following diagram shows how simple it is to understand and wire for Systemline Modular:



In its simplest form, it is just a series of CAT5 cables run to various locations from a central hub.

3.2 Wiring schedule

The following diagram shows how such a configuration is pre-wired:



The wiring schedule is explained in the table on the next page.

Ref. No.	Location	Requirements
①	**System room** Normally lounge or family room. Position near to FM socket.	1 x deep (minimum 44mm (2")) double-gang back box (position at low level). Run 4 x UTP CAT5 cables to the hub location, with tails in the order of 250mm (10") labelled, System Room Audio/IR, SR Spare 1, SR Spare 2, and SR Spare 3. **Note:** If provision for multi-source operation is not required, then only the Audio/IR cable is required. **Note:** If the hi-fi system is to be located out of sight, in the under-stairs cupboard, the wiring from 1 to 2 will not be required.
② ③ ④	**Under-stairs cupboard** Or alternative out of the way location.	The four cables from the system room should be labelled: Audio/IR, Spare1, Spare2, and Spare3 to correspond with the system room. Allows tails of 350mm (14"). Label cables going to the bedroom zone as Bedroom System Input, Bedroom Spare, Bedroom Local Audio. Other zones should be labelled using a similar system. Allows tails of 350mm (14"). Provision for hub: If the hub is to be used on its own (ie not within a structured wiring cabinet) a minimum area for hub for surface mounting 300 x 250mm (W x H) should be allowed for a single hub. To provide for some upgrade potential to a multi-source hub the total space available should be 300 x 500mm (W x H). Cable termination: The hub requires RJ-45 connection, and plugs can either be fitted to the flying leads that come directly out of the wall, or they can be terminated into patch panels. If patch panel termination is used, we would either recommend that a structured wiring box is specified, or that RJ-45 wall-mounted sockets are used. The maximum capacity for the latter is usually eight RJ-45 sockets per double-gang box. **Note:** Additional space would be needed for most of these options. Double-gang switched AC mains outlet required. FM aerial point also useful if a radio music source is to be located alongside the hub.
⑤ ⑦ ⑧	**Bedroom zone**	The three CAT5/6 cables arriving from the hub all go to the active speaker point (right-channel speaker). Cable marked Bedroom Local Audio is routed via the local input, where a loop of 400mm should be left in a back box of at least 44mm deep. All cable should be labelled meaningfully: Bedroom System Input, Bedroom Spare, Bedroom Local Audio, Bedroom Keypad, etc. 2m tails should be provided for and these should be coiled in the ceiling void at a position appropriate for the right-channel ceiling loudspeaker. A single CAT5/6 cable, labelled Left Speaker, should be run from the right-channel active speaker position to the left-channel passive speaker position. Tails of 2m should be left at either end.
⑥ ⑦	**Keypad for bedroom** Located alongside a light switch, or in a complementary position.	A further CAT5/6 cable labelled Keypad should be run to the keypad point. Leave a 2m tail at the speaker end and a 250mm coiled tail at the keypad back box. Back box should be at least 44mm deep.
	Other zones	Repeat the zone wiring for each of the other five zones, labelling the wires accordingly. If in doubt as to which rooms to wire for, always run a spare set of zone cables to the loft. These can then be routed for use in any one of the upstairs room.

Conclusion

By following the example shown in this chapter, it is possible to:

- Design and specify an extremely inexpensive wiring scheme that can be pre-installed into a new, refurbished or retro-wired home.
- Pre-fit a ready to use Systemline Modular system in to a new home so that all the customer has to do is to plug-in his or her own hi-fi system.
- Use this wiring scheme as the basis for designing a much more sophisticated system featuring sub-zones, etc.
- Allow considerable scope for upgrading at a later date.

4 Installation guidelines

This chapter provides installation guidelines, which should be read and understood before commencing specifying or wiring the installation.

4.1 Positioning of components

The following sections give advice about positioning each of the Systemline Modular components:

Active and passive speakers

The Systemline Modular speakers will normally be mounted flush in a ceiling, and they require a minimum clearance depth of 90mm from the front mounting face of the ceiling to the rear. They may also be mounted in a shallow wall panel such as in a fitted kitchen.

Each pair of speakers consists of an active speaker containing the amplification and the control logic, and a passive speaker which must be connected directly to the active speaker. A solitary active speaker switched to mono mode may be used in such locations as small bathrooms, see A*n expanded zone*, page 15.

The ceiling should be able to carry the weight of the speaker, up to 1.8kg. Be careful about old or damaged ceilings.

Please ensure that all relevant building and safety regulations are adhered to. Consult the relevant authority at the time of planning.

Note: The active speaker is always the right-channel and the passive speaker is always the left-channel.

Note: Once speaker cables have been run it is vital that their position is carefully noted on the plans to enable the cables to be found at a later time.

Keypads

Each room keypad may be positioned in a convenient location alongside, or complementary to, a light switch or lighting control keypad. Where the style/colour of the respective devices vary, it is often better to place the Systemline Modular keypad along the opposite edge of the door, or simply on a different wall to the light switch. Please remember however, that the audio control keypad is used in a very similar way to a light switch, so similar criteria apply.

Warning: Sunlight includes infra-red, so it is advisable to position keypads away from strong direct sunlight.

Note: Only one keypad can be connected to each active speaker.

Local input plate

The positioning of the local input plate depends on the room and is largely defined by application and the device likely to be plugged in as the local input. Where no information is available, it is probably best to position this socket near to a mains point and possibly alongside a telephone socket. Remember too, that the local input does not have to be positioned literally local to the room, see *Alternative zone configurations*, page 15.

Hub

The hub should be located very much like any other electrical services box. This would normally be under the stairs or any other convenient discreet position. The hub requires at least one switched AC mains outlet within easy reach, and preferably two to allow for future expansion.

Power supply

The power supply for any hub-based system is positioned alongside the hub. A wall mount bracket is also available.

Line-level source input/infra-red output socket plate

The natural position for these sockets is alongside an FM aerial point in the system room. It is also possible to locate the hi-fi system or music source component alongside the hub, in which case connections can be made directly to the hub, and the line-level source input and infra-red output modules will not be required.

4.2 Wiring considerations

Safety

The system should be installed according to the current building regulations.

We also specifically advise that:

- Systemline Modular wiring should not be installed alongside mains wiring.
- Mains wiring and CAT5 wiring should not be run to the same back box unless conditions stipulated in the relevant electrical regulations are met.
- The Systemline Modular system should use separate CAT5/6 cables and under no circumstances should conductors of the same cable be used for different purposes, such as telephone cabling or computer networking. Some products, such as telephone systems carry substantial voltages, which could damage the Systemline Modular system.

Type of cable

Systemline Modular is designed to work with standard Category 5 unscreened cable. This is normally referred to as CAT5 UTP (Unscreened Twisted Pairs). It will also work with CAT5e UTP and CAT6 UTP cables. CAT6 cable has the higher specification, and is therefore recommended where possible.

Maximum cable lengths

The maximum recommended cable length from the hub to either an active speaker or line-level input socket is 50m. This restriction is imposed by the need to supply the power to the remote zone via the CAT5 cable; longer runs are possible if alternative power supply arrangements are made, see the *Advanced* section, page 15.

The maximum cable length within a single zone is limited to 150m. Power-only cables, such as cables running from a PIM only, can be excluded from this calculation.

Individual maximum cable lengths are as follows:

- From active speaker to passive speaker: 30m.
- From active speaker to input module (local): 50m.
- From active speaker to keypad: 50m.
- From hub to line-level source input module/IR output module in system room: 50m.
- The PSM45 is suitable for remote power cables of up to 40m. For runs of 40 to 50m use a PSM130.

Connectors and tools

Systemline Modular uses IDC punch down connectors for all speaker, keypad, and connection plates. These are the superior type 110 variety, and the appropriate 110 tool must be used. Under no circumstances should any different type of tool be used.

The connection to the hub is via RJ-45 plugs. This can either be accomplished using RJ-45-to-RJ-45 patch leads from either a bank of wall-mounted RJ-45 sockets, or via RJ-45 patch panels. If the termination point at the hub consists of flying leads, these will require terminating with RJ-45 plugs. This will need an appropriate termination tool.

Other tools required to fit the Systemline Modular components include:

- A standard selection of screwdrivers.
- A suitable jigsaw to cut out the holes in the ceiling for the ceiling speakers.

Warning: The job of wiring and installing Systemline Modular should only be undertaken by a qualified electrician, a specialist audio installation engineer, or someone who possesses the relevant skills, knowledge, and experience. If in doubt, please seek the help of a trained professional installer.

Power supplies

There are two power supplies. For any hub-based system running two or more zones the PSM130 (130W) model should be used.

The PSM45 (45W) model should only be used as a local power supply for an expanded zone, see *Advanced configurations*, page 15, or to power a single zone system.

Installing the ceiling speakers

Full instructions are provided with the *Systemline Modular System Installation Guide.*

Locating concealed cables

With ceiling speakers as a standard fitment, the cable that loops between the passive and active speakers can be left hanging through the ceiling in the same way that a lighting cable would. This avoids any issues of tracing cables.

For installations that are pre-wired for ceiling speakers (but none are pre-installed), accurately mark up plans showing the cable loops. Otherwise trace cables using a tone generator. A Cable Tone Test set, available from electrical wholesalers, can be used to locate concealed cables.

Connect the tone generator to the cable being tested at the hub location (noting the correct label for a given room, see *Wiring schedule*, page 10 and move the probe over the ceiling until the tone reaches its peak sound level. The cable should be directly above the plasterboard at this point.

Note: The above cable tracing technique will not work with foil-screened stud walling, metal wall tiles or ceiling panels.

5 Advanced configurations

The examples so far have concentrated on a typical zone design featuring keypad or infra-red control of a single pair of stereo speakers. This chapter illustrates the flexibility and scalability of the system.

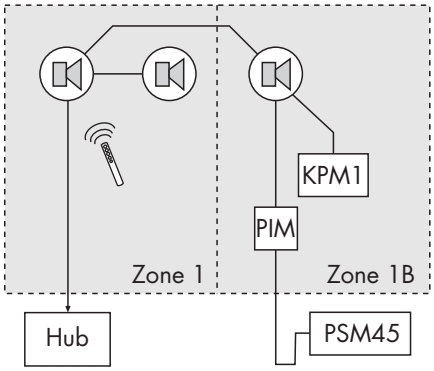
5.1 Alternative zone configurations

The following sections describe some of the possible alternatives for configuring systems.

Mono sound reproduction

Any zone or sub-zone can feature a single active speaker for mono sound reproduction. This can be achieved by just flicking a switch on the speaker from stereo to mono. When in mono mode, the speaker can be used alone, for applications such as small bathrooms. Alternatively, partnered with the passive speaker you can create a double mono configuration, which is particularly useful for places such as halls and landings.

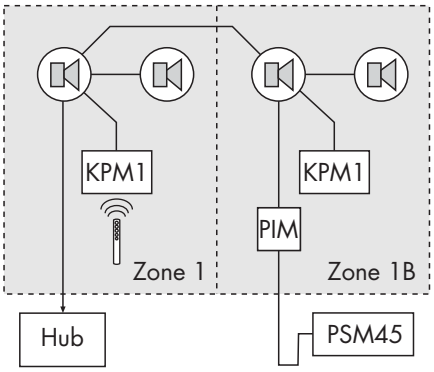
Active speaker switched to mono mode, shown used as a sub zone:



Sub-zones

For several closely related rooms such as a master bedroom, en suite bathroom, and dressing room, it makes sense for the same music to be playing throughout, but with independent volume control for each room. By using another pair of speakers, or a single active speaker switched to mono, and connected to the main zone it is possible to create such a sub-zone. Up to two sub-zones may be connected to one main zone. A local input may be connected to any active speaker. This also applies to sub-zones.

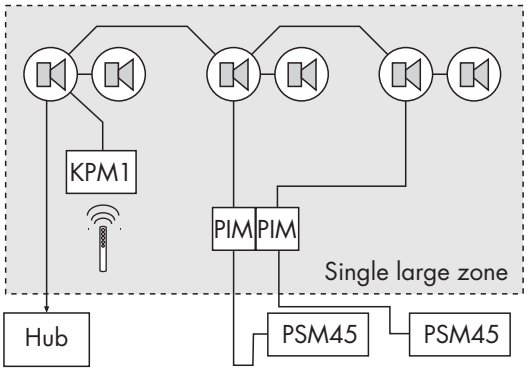
Sub-zone wiring configuration:



An expanded zone

A further option is to create an expanded main zone. This facilitates the placement of additional active speakers in the same room, and is a particularly useful solution for a single large room or open plan area that requires even distribution of sound throughout. Up to three pairs of speakers can be configured in this way.

Expanded zone configuration using three pairs of ASM2 speakers. In this example two pairs of ASM2 would be without the IR receivers. All speakers would carry the same address to allow simultaneous operation:



Only one KPM1 and one IR enabled speaker are permitted per zone. The KPM1 must be connected to the IR enabled speaker.

Powering expanded zones and sub-zones

Each active speaker requires a power supply connection. Due to the limits on the maximum current that can be drawn over CAT5 cable, it is not possible to share the power connection with the main zone. There are essentially two alternatives:

- Using a PIM, a power supply can be fitted within the zone.
- Run a CAT5 cable back to a PIM located next to the hub.

In the near future QED will offer a new product in the Systemline Modular range to facilitate the connection of a single power supply to serve multiple sub-zones.

Local input strategies

The most accurate way to think of a local input is to view it as zone specific; an input that is solely available in that zone. Typically, this might be for an input, such as a portable CD player, MP3 player, or personal computer. The same applies to feeding the stereo sound from a TV in that zone through the Systemline Modular ceiling speakers. However, the local input could also be fed from an alternative centralised location alongside the hub, which could accommodate the connection of a multi-output sound server. This would allow each zone to access a zone-specific source, via the selection of the local input.

Beyond six zones

It is possible to connect additional hubs to extend the scope of the single source multi-zone system to up to 18 zones and 36 sub-zones. This can easily be accommodated, without any need to change the described wiring infrastructure, by locating the music source next to the hub. If however there is a requirement to connect a music source remotely (eg in the system room), you should refer to a specific Application note that can be viewed at www.systemline.co.uk/modular. This explains what provisions need to be made for a 12 to 18 zone installation using a remote audio source.

5.2 Upgrading to multi-source

It is possible to upgrade a single source system to multi-source in four easy steps:

- Swap the KPM1 for a multi-source keypad. This fits in the same back box as the KPM1.
- Replace the RM1 handset for a multi-source handset.
- Replace the HM1 hub with a multi-source hub. This is physically bigger than the single source hub, but if the original guidelines have been followed, there will be space to fit this component.
- Replace the SIM and IRM with a multi-source socket plate.

More details will be published in due course on upgrading to multi-source multi-zone. For the latest information, please go to:

www.systemline.co.uk/modular

and look under multi-source.

6 Technical specifications

This section gives details and brief technical specifications for each of the components of the Systemline Modular system.

All wall mounted modules use System 45 modular fittings and wall plates. Please refer to www.hamilton-litestat.com and www.ave.it for details. QED supply standard white finish plates with white modules. For black modules the facia plates need to be ordered separately.

6.1 Speakers (ALM2/SLM2)

ALM2/IR = One active speaker with IR and LED indication and one passive speaker.

ALM2 = One active speaker without IR and LED indication and one passive speaker.

SLM2/IR = One active speaker with IR and LED indication.

SLM2 = One active speaker without IR and LED indication.

Each zone will typically contain a pair of ceiling-mounting speakers: an active right-hand speaker, containing the amplifier and control circuitry, and a passive left-hand speaker, consisting of a matching speaker with no active components.

If required, a single active speaker can be used on its own, switched to mono operation.

The active speaker has the following characteristics:

Audio

- Two-channel power amplifier.
- Microprocessor control and fault monitoring.
- High efficiency 250kHz Class D amplifier.
- High efficiency power supply regulation.
- Cool running.
- Balanced audio input and output.
- Local audio connection.
- Switchable Mono option.

Control

- Integrated IR Receiver.
- Automatic address configuration.
- Sophisticated Control Communications – enables synchronised active speaker pairs.
- Operational distance – up to 50m CAT5/CAT6.
- Flash programmable software.

Speaker

- 30W RMS power rating with 60-20kHz frequency range.
- Pivotal soft dome tweeter.
- 165mm (6.5”) polypropylene driver with polyurethane surround.
- Shielded magnet to ensure low distortion on active speaker.
- Moisture resistant cone assembly and fittings.

Connections

- All connections via Punch Down ‘Katts’ Connectors using 110 tool.
- System input from hub.
- Local audio input.
- Left speaker output.
- Next zone (sub-zone) output.
- Keypad input.
- Local power supply input.

6.2 Audio distribution hub (HM1)

The audio distribution hub is required in systems with more than one main zone, and each hub can distribute audio to up to six main zones.

The hub is compatible with structured wiring enclosures – RW Data (Home Cabling), OnQ and Open House with alternative adaptor brackets. Wall mounting brackets are also available.

Features

- Fully isolated balanced left and right audio outputs for each zone.
- Flash programmable software.
- Microcontroller based IR (Infra-red) data control.
- Remote and local audio input capability – switchable at hub.
- Electronically buffered audio source loop through.

Connections

- Six RJ45 zone outputs.
- One RJ45 remote audio input (includes IR back to source)
- Local stereo line-level input via RCA phono sockets.
- Loop through line-level output via RCA phono sockets.
- Two 'Modulated' infra-red IR outputs via 3.5mm jack sockets for direct connection to window emitters.
- One 'Unmodulated' infra-red IR output via 3.5mm jack socket for direct connection to window emitter.
- 30V DC power supply connection via 4 pin latching Kycon connector.
- IR Loop IN/Loop OUT via 3.5mm jack sockets.

Dimensions

- 145 x 131 x 42mm (W x H x D).

6.3 Infra-red remote control (RM1)

A stylish anodised aluminium infra-red remote control can be supplied to allow the system to be controlled either using the infra-red receiver in the active speaker, or via the wall-mounted keypad.

This provides five button controls giving: Standby/On/Volume+/Volume-/Mute/Local.

Features

- Battery accessible via screw cap – 12V type MN21, GP23A, VR22 28.5 x 9.5mm
- Normal operation: provides modular system control.
- Turns zone ON.
- Enables selection of local input.
- Enables/disables audio mute.
- Increases/decreases volume.
- Switches zone to standby.
- Life for 35mAh battery installed in handset: 1.9 years (shelf life).

Dimensions

- 155 x 21mm (W x dia).

6.4 Line-level source input module (SIM)

The line-level source input module is designed to fit in a standard single-gang wall box, and converts between line-level RCA phono inputs and balanced audio on CAT5 cables as required by the Systemline Modular system. A separate pair of RCA phono outputs is provided to allow the audio to be fed on to a tape recorder or power amplifier.

Features

- Frequency response 20Hz – 20kHz ± 1dB.
- Protected against accidental DC connection.
- Audio loop out via RCA phono sockets.

Connections

- RCA phono right and left-channel inputs.
- RCA phono right and left-channel outputs.
- IDC CAT5/6 output connector.

Dimensions

- 86 x 86 x 40mm (W x H x D) (44-47mm depth back box required).

6.5 Infra-red output module (IRM)

The infra-red output module is designed to fit in a standard single-gang wall box, and converts the infra-red signal provided from the Systemline Modular system to give three modulated infra-red outputs and one unmodulated infra-red output.

The modulated infra-red outputs will normally be connected to an infra-red window emitter, attached to the infra-red window of a third-party product. The unmodulated infra-red output can be connected to the infra-red input provided on some products.

Features

- 3x modulated IR outputs.
- 1x unmodulated IR output.

Connections

- 4 x 3.5mm mono jack socket IR outputs.
- IDC CAT5/6 punch-down connector.

Dimensions

- 86 x 86 x 38mm (W x H x D) (44-47mm depth black box required).

6.6 CIM option

This provides a SIM and IRM in a single plate.

Dimensions

- 144 x 86 x 40mm (W x H x D) (44-47mm depth back box required)

6.7 Keypad (KPM1)

The wall-mounted keypad fits in a standard single-gang lighting box, and provides control of the system using a three-key keypad. It includes an infra-red receiver.

Features

- Integrated IR receiver.
- Configurable standby, system, local, OFF toggle function.
- Software address can be set without removal from wall.

Connections

- IDC CAT5/6 punch-down connector.

Dimensions

- 86 x 86 x 38mm (W x H x D) (44-47mm depth black box required).

6.8 Power supplies (PSM45/PSM130)

Features

- PSM45: 45W power output.
- PSM130: 130W power output.

Dimensions

- PSM45: 75 x 146 x 43mm (W x H x D).
- PSM130: 86 x 195 x 54mm (W x H x D).

6.9 Power input module (PIM)

Dimensions

- 86 x 86 x 38mm (W x H x D) (44-47mm depth back box required).

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