

Si Series Option Slot & Card User Guide

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Version:

- V1.1 Added AES.
- V1.2 Added Aviom® & CobraNet™.
- V1.2.1 For initial release.
- V1.3.0 Added extra CN info and Installation of hot plugging.
- V2.0 Added BLU Link card
- V2.1 Updated BLU link information regarding number of consoles on a network
- V2.11 Corrected BLU link diagram with PMC16
- V2.12 BLU-Si card clock mode corrected (MASTER only)

Supported Cards:

MADI, MADI HD, AES, CobraNet™, AVIOM®, Multi Digital, BLU Link, DanteCard Installation and Removal:

The option card connectors are located behind blank panels on the rear of the console, use a hex key or Posidrive™ screwdriver to release the cover and retain this for future use.

When installing or removing a card ensure to observe the following:

- Do not over-tighten card retaining screws.
- Observe best practice regarding ESD (electrostatic discharge) before inserting or removing any option card.
- Ensure the console is switched off and all AC power cords are removed before installing or removing any option card.
- Do not use force; if the card does not locate and plug-in easily contact your distributor or Soundcraft Customer Service in the UK.

FAILURE TO OBSERVE THESE PRECAUTIONS MAY RESULT IN DAMAGE TO THE CONSOLE AND / OR THE OPTION CARD.

Introduction:

The Si 1,2 3 including '+' series of consoles feature a versatile 128 channel expansion bus offering 64 discrete additional input sources and 64 additional output patches that may be used in parallel to fan-out to multiple destinations. Routing *from the cards to the processing channels* and *from channels or buses to the option card buses* is achieved via the 'Patching' functionality; see the console user guide for details.

IMPORTANT: Setting of DIP switches on Si 1,2,3 including '+' variants is *critical* since the console option slots share an expansion bus. Setting of dip switches on Si Performer, Si Compact and Si Expression is not critical as there is an expansion bus dedicated to each option slot.

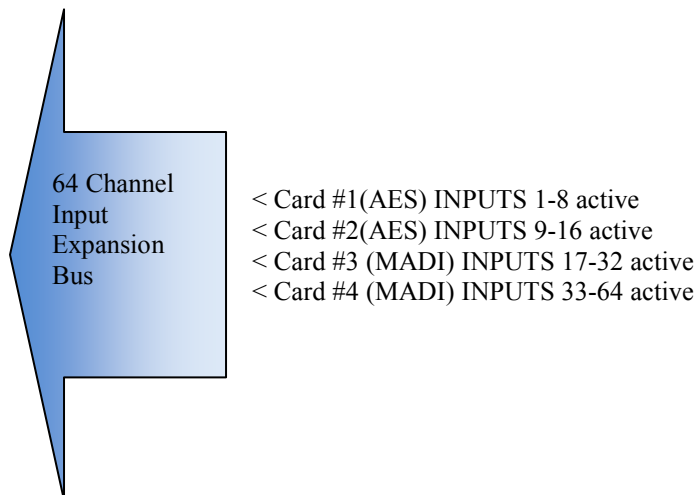
Theory of Operation:

Inputs – All of the 64 expansion bus inputs are present at all expansion slot positions; any *card* may route to any expansion bus however only *one* card may be set to route to any one bus at any one time, as an example if you require 64 inputs from a MADI card then no routing from other input cards may be active at the same time; see 'DIP SWITCH SETTINGS' for your option cards for details on how to activate / de-activate routing to the expansion bus.

NOTE: There is a clear distinction between patching & routing; ***patching*** is the act action of assigning an available signal source to a processing channel whilst option card whilst ***routing*** is the action of enabling / disabling outputs of an option card to the expansion bus for where it may then be patched to a DSP channel.

Example Configurations:

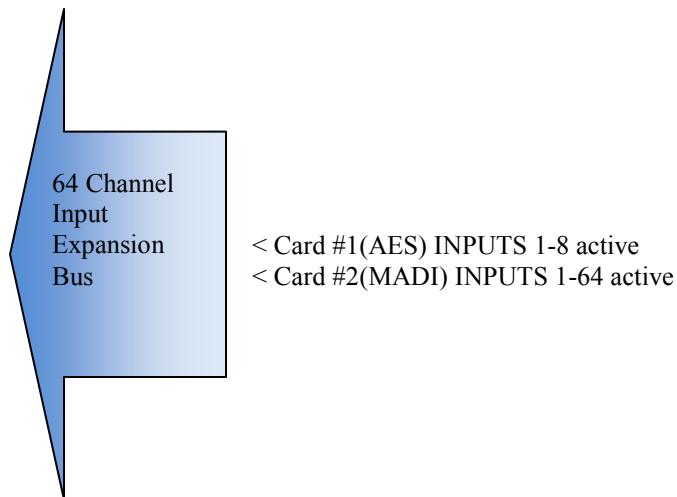
An example of a **valid** configuration:



This configuration uses all four slots found in an Si3 / Si2 but no two cards are trying to route to the same bus.

NOTE: Si1 has only two option slots but the same principles apply.

An example of an *invalid* configuration:

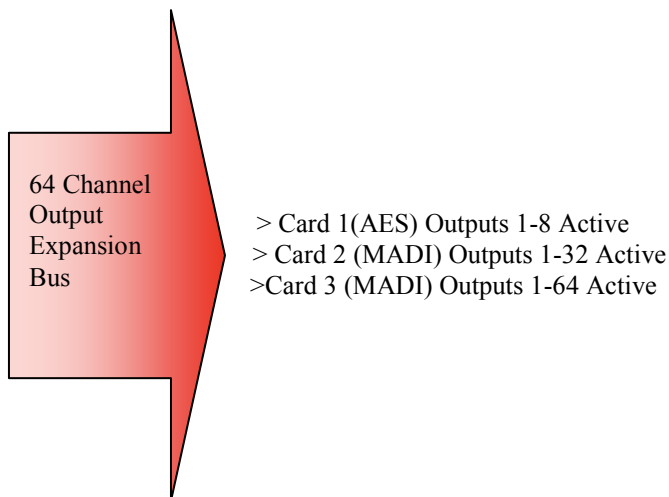


In this example there is a clash between the two cards as both are trying to 'route' to buses 1-8 and the conflict must be resolved by resetting of the routing dip switches on one or other of the cards.

Outputs – The operation of the outputs is slightly different; whilst it is the case that only one audio source in the console may feed any given output or expansion bus any *or all* of the cards may 'listen' to what has been patched to the expansion bus. This topology allows great versatility when you are required as an example to direct outputs to multiple destinations simultaneously.

The DIP switches on the option cards may still be used to limit or choose which signals the card uses in the event you do not wish all cards to re-transmit all channels.

A typical example of an output configuration:



Card Switch Settings:

IMPORTANT: Setting of DIP switches on Si 1,2,3 including '+' variants is *critical* since the console option slots share an expansion bus. Setting of dip switches on Si Performer, Si Compact and Si Expression is not critical as there is an expansion bus dedicated to each option slot.

Each Si option card features 8 DIP switches arranged as two groups of four, these enable or disable inputs to or outputs from the option card and expansion bus. The table below illustrates the function of the DIP switches found on the Si Series option cards:

Switch name	CH 8	CH 16	CH 32		CH 64			
			Desk DIO					
	1 to 8	9 to 16	17 to 24	25 to 32	33 to 40	41 to 48	49 to 56	57 to 64
8 channel option card	1 to 8	1 to 8	1 to 8	Unavailable	1 to 8	Unavailable	Unavailable	Unavailable
16 channel option card	1 to 8	9 to 16	1 to 8	9 to 16	1 to 8	9 to 16	Unavailable	Unavailable
24 channel option card	1 to 8	9 to 16	17 to 24	Unavailable	1 to 8	9 to 16	17 to 24	Unavailable
32 channel option card	1 to 8	9 to 16	17 to 24	25 to 32	1 to 8	9 to 16	17 to 24	25 to 32
64 channel option card	1 to 8	9 to 16	17 to 24	25 to 32	33 to 40	41 to 48	49 to 56	57 to 64

Setting any given input switch shall enable routing of the INPUTS **TO** THE OPTION CARD to the given channels on the expansion bus.

Setting any given output switch shall enable routing of the SIGNALS ON THE EXPANSION BUS (outputs from the console) **TO** THE OPTION CARD.

It is important to remember that the *patching* of I/O signals to / from the expansion bus is unrelated to the setting of the physical switches on option cards; the card switches dictate only which channels of the option card bus the expansion card can monitor / route to.

NOTE: There are some exceptions to the above, please refer to the Switch Settings section of each card type for full details.

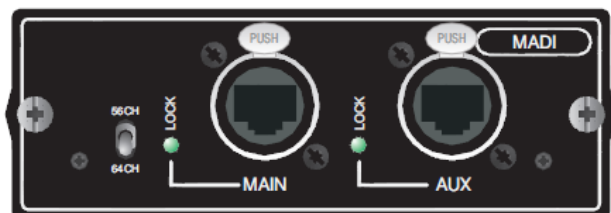
Si Series MADI Cards

The Soundcraft® Si MADI HD cards establish a 64-channel MADI input and output link between a console and a remote device such as a Soundcraft Mini Stagebox 32 or other MADI device equipped with an appropriate MADI input.

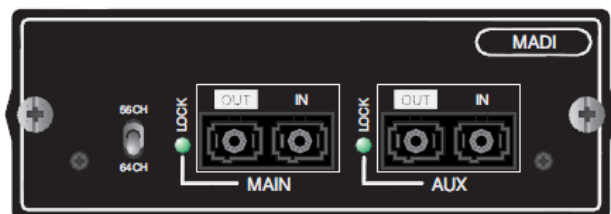
The cards are available in the following forms:



Single Port CAT5 (non redundant link)



Dual Port CAT5 (redundant link)



Dual Port Multi-Mode SC Optical (redundant link)
and
Dual Port Single-Mode SC Optical (redundant link)

NOTE: Stagebox compatibility with any given console depends on the console series and software running on that console. Please refer to the latest user manual for the Mini Stagebox or similar accessory to which you wish to connect.

NOTE: The Si MADI HD variant cards must not be installed in consoles.

Specifications

Max. cable length single-mode fibre 1300 nm <15 km 8.3/125µm

Max. cable length multi-mode fibre 1300 nm <2 km 62.5/125µm (compatible with 50/125µm)

Max cable length of Soundcraft supplied CAT5 cable 100m

Input frequencies 48 kHz ±3 ppm

Current consumption (3.3 V) 0.4A

(5 V) 0.4A

Operating temperature 0...45° C

Switch Settings:

Input Switches Settings:

CH IN 1-8 – MADI channels 1-8 feed expansion bus inputs 1-8

CH IN 9-16 – MADI channels 9-16 feed expansion bus inputs 9-16

CH IN 17-32 – MADI channels 17-32 feed expansion bus inputs 17-32

CH IN 33-64 – MADI channels 33-64 feed expansion bus inputs 33-64

Output Switches Settings:

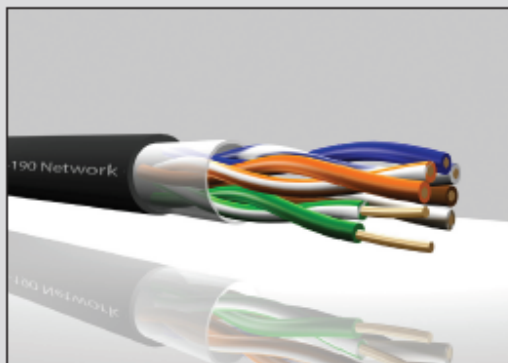
The switches have no function; all expansion bus outputs feed MADI channels 1-64

DATA SHEET

Part No. 301-190

PRODUCT

Evolution XPC Heavy Duty Tactical CAT5E



CABLE CONSTRUCTION

Unshielded 4 twisted pairs	
Conductor	
Solid bare copper	
Insulation	
Material	Polyethylene
Insulation Colour:	
Pair 1	White-Blue/Blue
Pair 2	White-Orange/Orange
Pair 3	White-Green/Green
Pair 4	White-Brown/Brown
Inner Jacket	
Material	Clear TPE
Diameter (mm)	4.8
Jacket	
Material	TPE
Diameter (mm)	6.2
Jacket Colour	Black
Marking	
Evolution XPC Heavy Duty Tactical CAT5E 301-190	
Revision History	
DCS-02 28-02-2004	

ELECTRICAL CHARACTERISTICS

Conductor Resistance	93.5Ω/km @ 20°C
Nominal Mutual Capacitance @1kHz (nF/km)	50
Skew @100MHz	15ns/100m typical
Attenuation at 20°C (-dB/100m)	
@ 1MHz	1.90
@ 4MHz	3.90
@ 10MHz	6.20
@ 16MHz	7.90
@ 20MHz	8.90
@ 31.25MHz	11.20
@ 62.5MHz	16.00
@ 100MHz	19.80

General Standard	10 Base-T, 100 Base-T, 1000 Base-T (Gigabit Ethernet)
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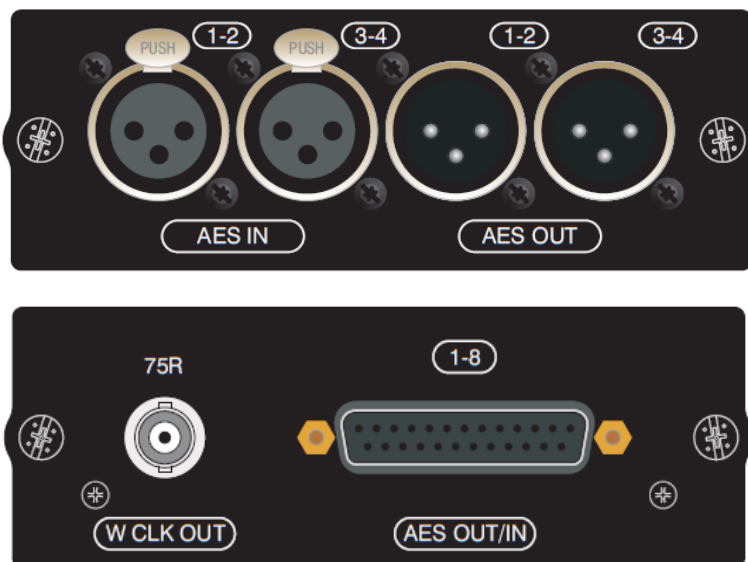


DirectCable
Systems Ltd

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Si Series AES Cards

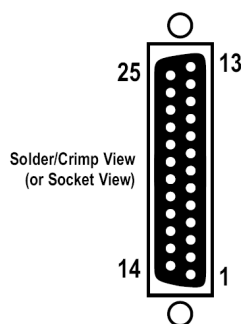
The AES I/O cards offer standard AES inputs and outputs conforming to the AES 3 specification. The card is available in two versions either 4ch IN and 4ch OUT on XLR connectors or 8ch IN and 8ch OUT on a 25w SUB-D female connector.



Specifications

Input/output impedance 110 Ω
 Input sensitivity min. 0.2 V
 Output level (into 110 Ω) 3.3 V
 SFC range 22...108 kHz
 Operating temperature 0...45° C

Pin Configurations - SUB-D Connector



Pin	Signal "CH 1...8"	Pin	Signal "CH 1...8"
1	CH 7/8 out +	14	CH 7/8 out -
2	CH 7/8 out screen	15	CH 5/6 out +
3	CH 5/6 out -	16	CH 5/6 out screen
4	CH 3/4 out +	17	CH 3/4 out -
5	CH 3/4 out screen	18	CH 1/2 out +
6	CH 1/2 out -	19	CH 1/2 out screen
7	CH 7/8 in +	20	CH 7/8 in -
8	CH 7/8 in screen	21	CH 5/6 in +
9	CH 5/6 in -	22	CH 5/6 in screen
10	CH 3/4 in +	23	CH 3/4 in -
11	CH 3/4 in screen	24	CH 1/2 in +
12	CH 1/2 in -	25	CH 1/2 in screen
13	n.c.		

Pin Configurations - XLR Connectors:

PIN#1 GND
 PIN#2 HOT
 PIN#3 COLD

Input Switch Settings:

CH IN 1-8 – AES channels 1-8 [1-4] feed expansion bus inputs 1-8 [1-4]
 CH IN 9-16 – AES channels 1-8 [1-4] feed expansion bus inputs 9-16 [9-12]
 CH IN 17-32 – AES channels 1-8 [1-4] feed expansion bus inputs 17-24 [17-20]
 CH IN 33-64 – AES channels 1-8 [1-4] feed expansion bus inputs 33-40 [33-36]

Output Switches Settings:

CH OUT 8 – Expansion bus outputs 1-8 feed AES outputs 1-8 [1-4]
 CH OUT 9-16 – Expansion bus outputs 9-16 feed AES outputs 1-8 [1-4]
 CH OUT 17-32 – Expansion bus outputs 17-24 feed AES outputs 1-8 [1-4]
 CH OUT 33-64 – Expansion bus outputs 33-40 feed AES outputs 1-8 [1-4]

NOTE: Numbers in [Square Brackets] relate to the XLR version of the card

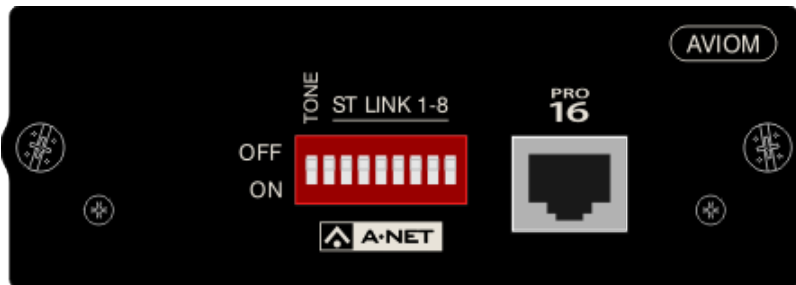
NOTE: Although an AES card may have fewer channels than the expansion bus group enabling the switch occupies all the channels within the expansion bus group to which it is enabled e.g. if enabling group 17-32 there will be no audio on expansion bus channels 25-32 [21-32].

Si AVIOM® Card

This card allows implementing the head of an AVIOM® A-Net Pro-16 chain, with this standard, 16 mono signals can be fed to an infinite number of AVIOM® personal mixers (such as the A-16 II) may be connected in a daisy chain configuration; The Si A-Net card will be the start of the chain and provide the audio and synchronization data to the chain.

DIP switches on the front panel allow grouping two adjacent channels to one stereo channel and generating a test tone. This card works at sampling frequencies of 44.1 or 48 kHz only.

For more information on AVIOM® visit their web site <http://www.aviom.com/>



Input Switch Settings:

CH IN 1-8 – No function, set to ‘OFF’
CH IN 9-16 – No function, set to ‘OFF’
CH IN 17-32 – No function, set to ‘OFF’
CH IN 33-64 – No function, set to ‘OFF’

Output Switch Settings:

CH OUT 8 – Expansion bus outputs 1-8 feed AVIOM® outputs 1-8
CH OUT 9-16 – Expansion bus outputs 9-16 feed AVIOM® outputs 9-16
CH OUT 17-32 – Expansion bus outputs 17-24 feed AVIOM® outputs 1-16
CH OUT 33-64 – Expansion bus outputs 33-40 feed AVIOM® outputs 1-16

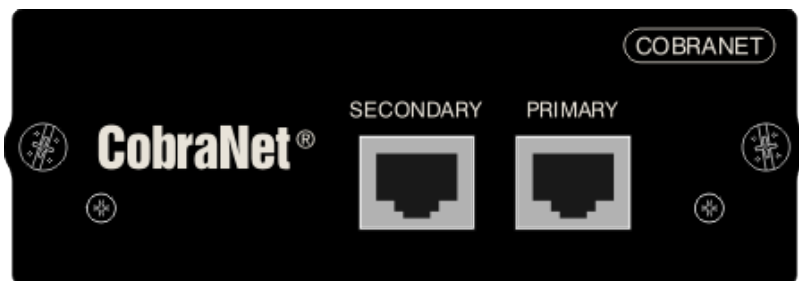
Specifications

Operating temperature 0...40° C

Si CobraNet™ Card

This card allows sending and receiving of up to 32 audio channels to/from a CobraNet™ network. DIP switches on the card allow setting the number of input or output channels seen by the console. Default setting is 32 output and 32 input channels. By default, the module is configured to be the conductor (synchronization master) and providing multicast bundles 1...4 to the CobraNet™ network. This setting is ideal for e.g. providing audio channels to a PA, installed sound, or monitoring system using CobraNet™.

For further information on CobraNet™ please visit their web site <http://www.CobraNet.info>



Input Switch Settings:

- CH IN 1-8 – CobraNet™ channels 1-8 feed expansion bus inputs 1-8
- CH IN 9-16 – CobraNet™ channels 9-16 feed expansion bus inputs 9-16
- CH IN 17-32 – CobraNet™ channels 1-16 feed expansion bus inputs 17-32
- CH IN 33-64 – CobraNet™ channels 1-32 feed expansion bus inputs 33-48

Output Switch Settings:

- CH OUT 8 – Expansion bus outputs 1-8 feed CobraNet™ outputs 1-8
- CH OUT 9-16 – Expansion bus outputs 9-16 feed CobraNet™ outputs 9-16
- CH OUT 17-32 – Expansion bus outputs 17-24 feed CobraNet™ outputs 1-16
- CH OUT 33-64 – Expansion bus outputs 33-40 feed CobraNet™ outputs 1-32

Specifications

Operating temperature 0...40° C

Si-Series CobraNet™ Card Setup Guide

This guide describes typical setup of a laptop or PC and running of the CobraNet™ Discovery® utility, to configure the settings of the Si series CobraNet™ card.

NOTE: The exact configuration and screen shots will be dictated by your network setup, laptop / PC setup and/or other devices connected to the network therefore it is not possible to give exact details for individual parameters, but this guide shows how to access and edit those parameters.

It is recommended that setting up a CobraNet™ network is carried out by an experienced person, but if more information is required, useful documents can be downloaded from the CobraNet™ website, on <http://CobraNet.info>

Tested Configuration:

Si Compact V1.1.5

CobraNet™ Module CM1 2.21.0 rev 4

CobraNet™ Discovery V4.0.3

Installing CobraNet™ Discovery software to allow configuration of Si-Series CobraNet™ card

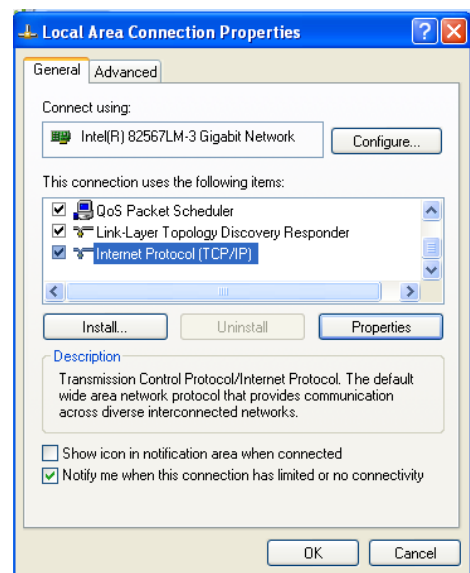
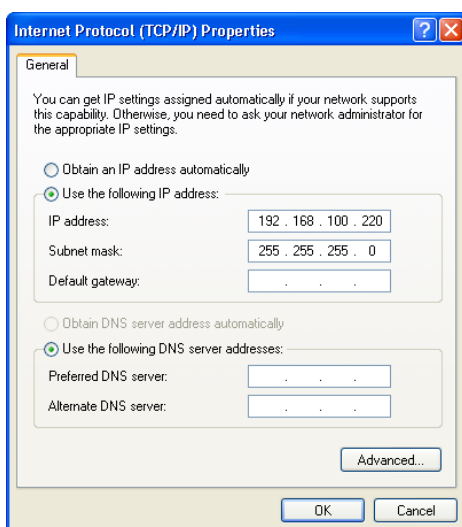
CobraNet™ Discovery® is a free utility provided by the manufacturers of CobraNet™ hardware, Cirrus Logic. Version of the program V4.0.2 or above allow not only the monitoring of CobraNet™ device parameters, but also the configuration of settings such as bundle numbers, latency and bit depth.

The program can be downloaded from the website <http://www.CobraNet.info> – follow the Downloads link on this page. If you have an older version of CobraNet™ Discovery remove this and install the latest version.

Setting up the Ethernet port on the Laptop / PC

The Laptop / PC needs to have its network port configured to have a fixed IP address in order to communicate with the CobraNet™ card:

1. On the Laptop / PC:
 - **Start > Control Panel > Network Connections.**
 - **Right-click** the network connection you are going to use.
 - Select **Properties.**
2. From the **General** tab select **Internet Protocol (TCP/IP)** and click on **Properties**

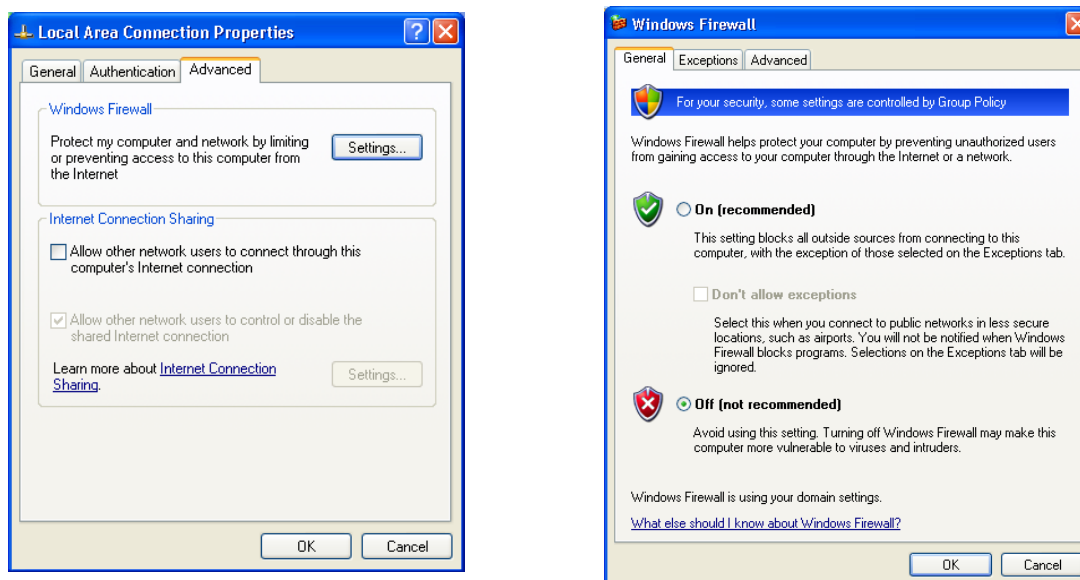


3. Select **Use the following IP address** and type in the IP address and subnet mask as shown.

If you are only connecting to the Si CobraNet™ card it does not really matter what the actual IP address is, but it is recommended to set it as above.

Click **OK** to close the TCP/IP dialogue box.

4. In the **Local Area Connection** box, select the **Advanced** tab at the top, and then click the Windows Firewall **Settings** button:



Make sure the firewall is set to **Off**.

Click **OK** on all dialogues to exit the Local Area Connection properties.

Note: You may have to reverse the above settings 1-4 if you subsequently need to connect the laptop to a business LAN, so it is best to use a separate network port if available.

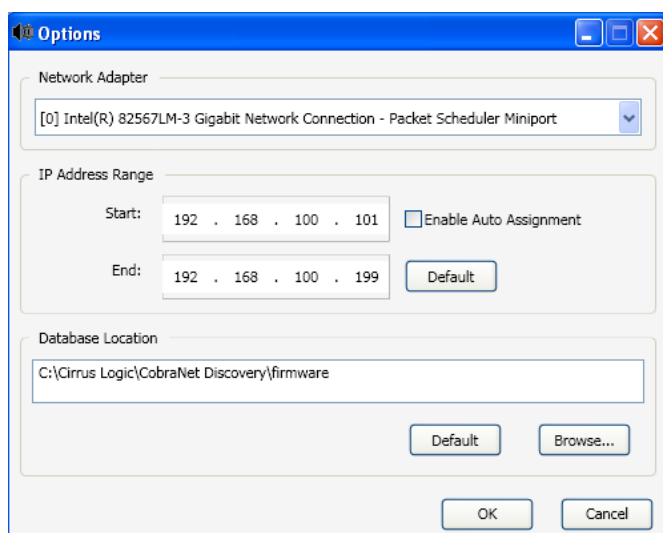
Setting up CobraNet™ Discovery to configure the Si series CobraNet™ card

1. Start the Si console and connect the laptop or PC Ethernet port to the Primary port on the CobraNet™ card; this should be done with a crossover Ethernet cable. Both LEDs on the CobraNet™ card should start flashing when correctly connected to the laptop or PC.

Note: Depending on the laptop, a 'straight' cable may be used, if the laptop supports both cable types or use a switch between the laptop / PC and CobraNet™ card. Using a switch enables other CobraNet™ devices to be connected at the same time and their configuration inspected and changed if necessary to match the Si (Note: do not change a BSS London's CobraNet™ parameters using CobraNet™ Discovery).

2. Start the CobraNet™ Discovery program and select **Tools>Options**.

In the **Network Adaptor** dialogue, select the network controller that your laptop or PC is using for connection to the CobraNet™ card.

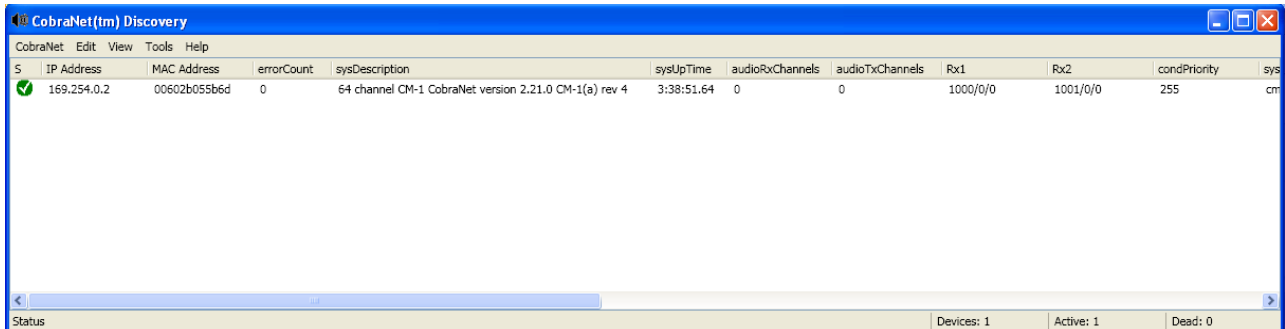


In the **IP Address** range fields enter values as above, and then check the 'Enable Auto Assignment box'. Click **OK** to return to the main Discovery window.

Note: this procedure is normally only required the first time you connect to the Si card.

3. The CobraNet™ Discovery should now see the Si CobraNet™ module in the Discovery window, with a green ‘tick’ icon on the left and an IP address similar to that shown:

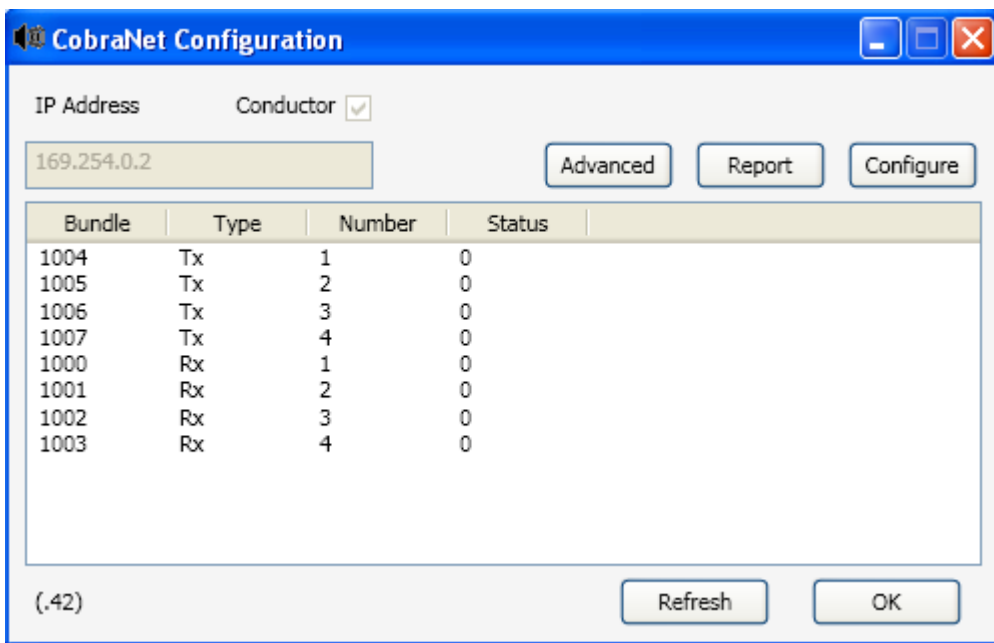
The IP address is only used for the purposes of connecting to the configuration computer, so what the actual address is does not matter, as long as it is in the same subnet as the laptop or PC’s Ethernet port.



4. To configure the CobraNet™ card right-click on the Si CobraNet™ device to select it, then choose **Tools>Configure**.

The Configuration box appears, showing the current bundle number setup.

You will need to change the bundle configuration of either the Si card or the external equipment so as the transmit number of one matches the receive number of the other, in order to pass audio.



5. The bundle numbers can now be changed as required by either directly editing the bundle number fields, or selecting one of the four transmit or receive bundles and clicking the 'Configure' button, which opens a more detailed Configuration dialogue box:

IMPORTANT

The Si CobraNet™ card is set from the factory to have 4 transmit bundles (32 channels) and 4 receive bundles active.

The number of transmit and receive channels is also set on the CobraNet(tm) card PCB via DIP switches. These switches determine how many channels are available in the Si6 Input and Output patching touch screens,

If the number of transmit and/or receive channels is changed from the default, the DIP switches on the CobraNet™ card should also be changed to match.

The **SubFormat** parameter allows the bit depth to be changed to match the network but if changed to 24 bits, it is not possible to use all 8 channels in the bundle.

6. Changing the Latency, sample rate and card name

The Advanced Configuration dialogue box is used to set the Latency and Sample rate of the Si CobraNet™ card (this is the parameter called **modeRate Control**).

These **must** match the other devices in the network, otherwise the system will not work.

Note: With latency setting of 1.33ms, only 7 channels per bundle are allowed.

IMPORTANT

The Conductor Priority parameter must be left at / set to a value of 255. This is the highest priority and indicates that the Si console will always be the clock master for the entire network.

If necessary, the Name, Location and Contact fields can be changed to identify the console in more detail.

Do not change any other fields!

In particular, the 'Persistence' box must not be unchecked, otherwise all setup data will be erased.

For more information on CobraNet™ parameters, see the website [www.CobraNet\(tm\).info](http://www.CobraNet(tm).info)

BLU-Si BLU Link Card User Guide

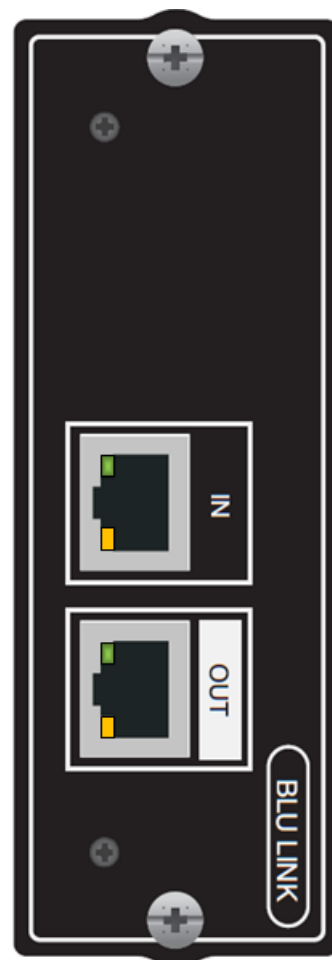
The BLU-Si BLU link card is a 32 x 32 interface between an Si series console*¹ and the Soundweb London digital audio bus, informally known as BLU link. The card allows connection to a wide variety of Harman products equipped with a BLU link interface such as BSS London BLU-800, dbx[®] PMC or Crown[®] PIP-BLU interfaces amongst others.

Note: Because of the clocking system architecture, it is only possible to use one BLU-Si card/console combination on a BLU link network at any time.

BLU link is a low latency, fault tolerant digital audio bus of 256 channels which uses standard CAT5e cabling and gives a distance of 100m between compatible BLU link enabled devices. To increase the distance between devices the BSS Audio MC-1 fibre optic media converter can be used to span over 10km (6.2 miles) using single mode fibre.

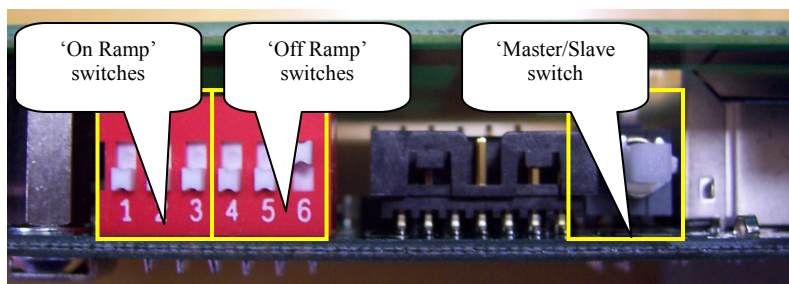
Additional information about the Soundweb London BLU link digital audio bus may be found on the BSS web site www.bssaudio.com

*1 Not Si1, 2, 3 or 'plus' variants



Configuring The BLU Link Card

Before the BLU link card may be used the switches that define master / slave status and channel assignment must be configured:



The master / slave status determines the clock source for the BLU link network. Currently only MASTER status is supported, therefore the switch must be set **IN**.

Channel Assign Switches

The channel assign switches dictate which group of channels on the BLU link network the card ‘listens’ to and ‘speaks’ to. Looking directly at the dip-switch block are six switches numbered 1-6 (left to right). The leftmost three switches (switches 1-3) are used to select the on-ramp (card speaks to BLU link) bank. The rightmost three switches (switches 4-6) are used to select the off-ramp (card listens to BLU link) bank. Channels not used by the BLU-Si card are simply passed ‘thru’.

BLU Link On Ramp					
SW1	SW2	SW3	Binary Value	Selected Bank	Selected Channels
OFF	OFF	OFF	0	1	1-32
OFF	OFF	ON	1	2	32-64
OFF	ON	OFF	2	3	65-96
OFF	ON	ON	3	4	97-128
ON	OFF	OFF	4	5	129-160
ON	OFF	ON	5	6	161-192
ON	ON	OFF	6	7	193-224
ON	ON	ON	7	8	225-256

BLU Link Off Ramp					
SW4	SW5	SW6	Binary Value	Selected Bank	Selected Channels
OFF	OFF	OFF	0	1	1-32
OFF	OFF	ON	1	2	32-64
OFF	ON	OFF	2	3	65-96
OFF	ON	ON	3	4	97-128
ON	OFF	OFF	4	5	129-160
ON	OFF	ON	5	6	161-192
ON	ON	OFF	6	7	193-224
ON	ON	ON	7	8	225-256

NOTE: Whenever the On Ramp and Off Ramp selections match no audio is extracted from BLU link, rather the output audio out from the BLU link card (going to the Si console) will match exactly the audio being inserted onto BLU link from the console.

BLU Link LED Indicators

Each BLU link port features two LED's indicating status:

- **Yellow LED** - The state of the yellow LEDs indicate the following conditions:
 1. **One LED On:** When connected to a BLU link ring, this state indicates the BLU-Si card is not configured as BLU link master and identifies the port which is receiving the BLU link master clock.
 2. **Both LEDs On:** Indicates the BLU-Si card is configured as the BLU link master.
 3. **Alternately Flashing:** Indicates the console clock is not detected by the BLU-Si card or the BLU link network sample rate differs from the console's internal sample rate.
- **Green LED** - lights when it is connected correctly to another BLU link device.

Connecting BLU Link Devices

BLU link devices interconnect using standard CAT5e UTP Ethernet cable. Connections must be made from the OUT of one device to the IN of the next.

Redundancy is achieved by linking the OUT of the last device to the IN of the 1st device as shown below.

