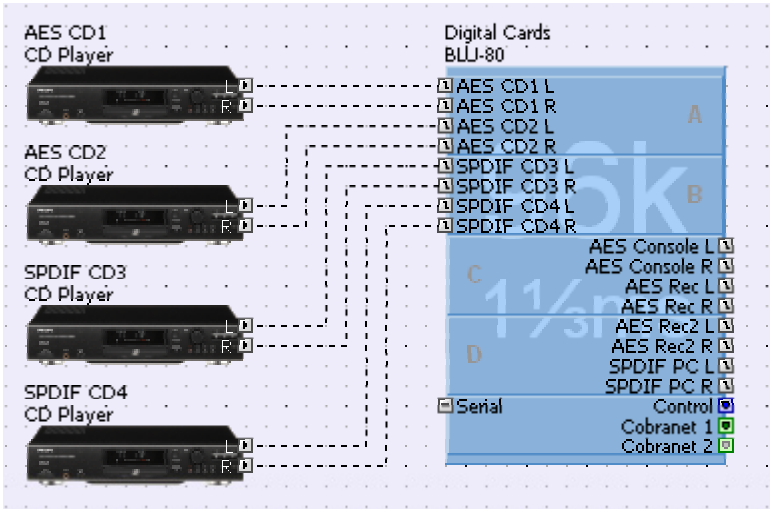
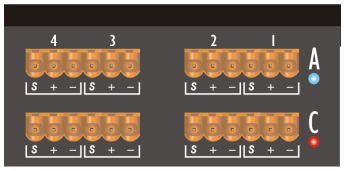
Soundweb™ London

Introduction

The Soundweb™ London Digital Input Cards and Digital Output Cards are designed to populate any of the four card slots on Soundweb London BLU-80, BLU-32 and BLU-16 devices. These digital cards enable Soundweb London devices to send and receive AES/EBU and S/PDIF audio signals.



Basic Functionality



The Digital Input Cards and Digital Output Cards each have two connectors which are used as follows: -

Digital Input Cards *(Card position "A" in rear panel diagram)*

- Connector 1 *(Connector on right hand side in rear panel diagram)*
  - Stereo Audio, Channels 1&2 – AES/EBU
  - Stereo Audio, Channels 3&4 – AES/EBU

- Connector 2 *(Connector on left hand side in rear panel diagram)*
  - Stereo Audio, Channels 1&2 – S/PDIF
  - Stereo Audio, Channels 3&4 – S/PDIF

Digital Input Card Connections

```
Connector    [S/PDIF Combicon]      [AES/EBU Combicon]
Signal pair    3&4       1&2          3&4       1&2
Pin          [S + -]   [S + -]      [S + -]   [S + -]


AES/EBU      Positive: to +         S/PDIF      Signal       : to +
             Negative: to -                     Signal Ground: to -
             Shield  : to S                     Shield*      : to S

*short 'S' to '-' for unshielded cable
```

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Digital Output Cards *(Card position "C" in rear panel diagram)*

- Connector 1 *(Connector on right hand side in rear panel diagram)*
  - Stereo Audio, Channels 1&2 – AES/EBU / S/PDIF
  - Stereo Audio, Channels 3&4 – AES/EBU / S/PDIF

- Connector 2* *(Connector on left hand side in rear panel diagram)*
  - Clock Input – High Impedance
  - Clock Input – 75R Terminated

*active clock selected within HiQnet London Architect

Digital Output Card Connections

```
Connector    [  Clock Input  ]      [  Audio Output  ]
Signal pair    3&4      1&2          3&4       1&2
Pin          [S + -]   [S + -]      [S + -]   [S + -]

Clock Input Positive: to +         AES/EBU     Positive     : to +
            Negative: to -                     Negative     : to -
            nil or -: to S                     Shield       : to S

                                   S/PDIF      Signal       : to +
                                               Signal Ground: to -
                                               Shield*      : to S
```

*short 'S' to '-' for unshielded cable

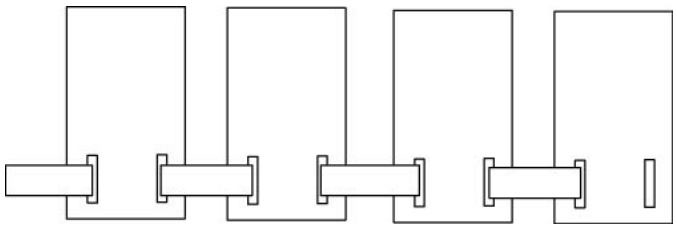
Digital Card Configuration

The digital cards can be configured, within HiQnet™ London Architect™, in the following ways: -

- 2 Stereo AES/EBU signals
- 1 Stereo AES/EBU signal / 1 Stereo S/PDIF signal
- 2 Stereo S/PDIF signals

SyncBus

SyncBus is used to sync the Digital Output Card to another digital card.

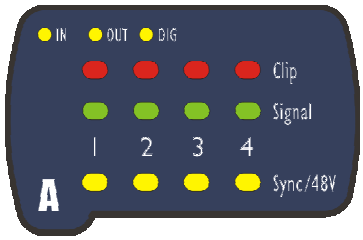


All digital cards are connected through a parallel bus.

Each digital card has 2 *SyncBus* connectors so that all cards can be daisy chained together.

SyncBus is used automatically when a digital output card is synced to another digital card and the clock is sent from one card to the other.

Front Panel Information on Soundweb London Devices

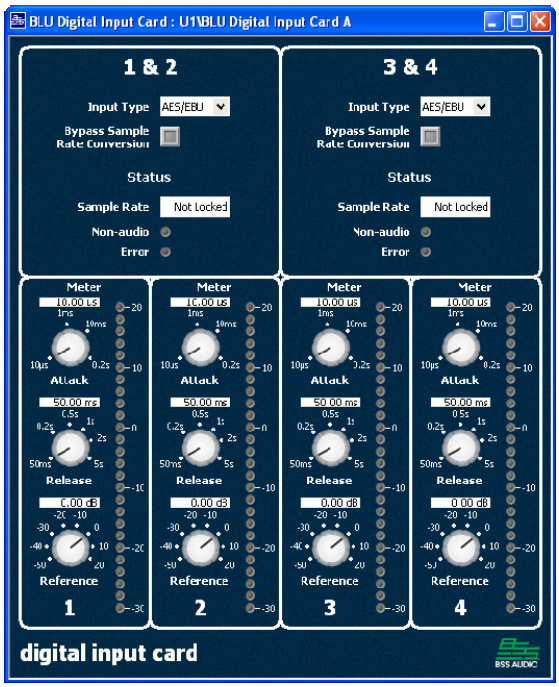


- In, Out, Dig LEDs – indicate which card is contained within the card slot
  - Digital Input Card – 'IN' and 'DIG' illuminated
  - Digital Output Card – 'OUT' and 'DIG' illuminated
- Sync/48V LED – illuminates to indicate that signals are synced
- Signal LED – indicates signal present (illuminates at -40dBFS)
- Clip LED – indicates high signal at input stage*

**Note: The Clip LED may illuminate frequently when using digital inputs. This is no cause for concern as digital playback media is often normalized to 'Full Scale', resulting in a highly optimised but implicitly safe signal.*

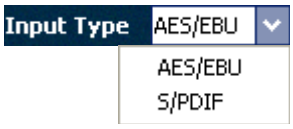
HiQnet™ London Architect Software Configuration

Digital Input Cards



The *Digital Input Card* Default Control Panel allows users to configure, control and monitor a *Digital Input Card.*

Input Type



Input Type allows AES/EBU or S/PDIF digital inputs to be selected per stereo signal.

Bypass Sample Rate Conversion

The *Bypass Sample Rate Conversion* button allows users to bypass the sample rate conversion per stereo signal in order to improve audio quality for matched sample rates.

Note: For trouble-free operation of Bypass Sample Rate Conversion, the external clock must be the same sample rate as the device; either 48 kHz or 96 kHz and ultimately locked to the same clock source. If the clocks are not locked drift may occur, resulting in audible clicks.

Sample Rate

Sample Rate shows the current sample rate per stereo signal.

Possible values are: -

- 32 kHz
- 44.1 kHz
- 48 kHz
- 88.2 kHz
- 96 kHz
- Not Locked – *no signal present*
- Out of Range – *signal is present and may be correctly received but lies outside the legal range for locking outputs*

Non-audio LED

The *Non-audio LED* illuminates when the input is locked but receiving invalid audio.

Error LED

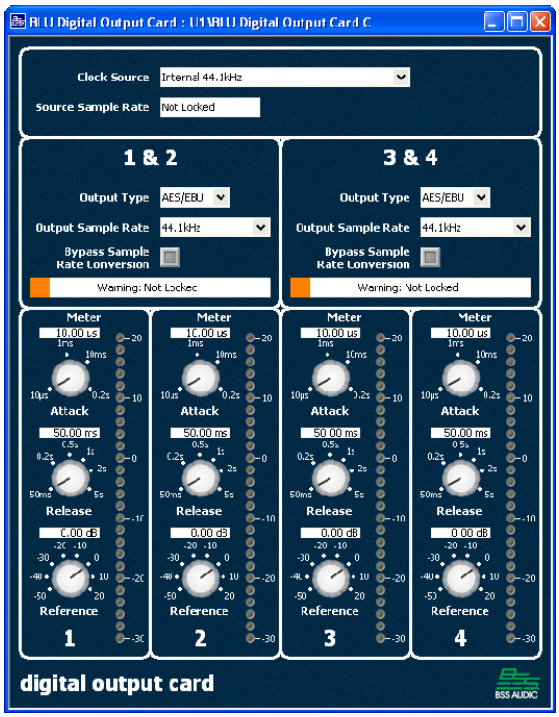
The *Error LED* illuminates when there is a problem with the incoming digital stream. Audio may be present but the cause of the error should be investigated.

Input Meter

The *Input Meter* gives clear input channel metering and offers the following ballistics properties: -

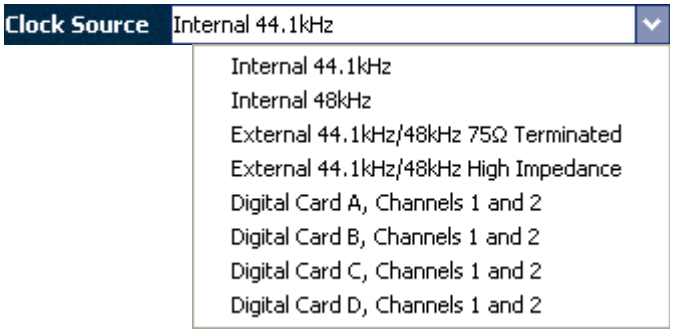
- Attack – attack rate (or speed) of meter
- Release – release rate (or speed) of meter
- Reference – 0dB reference point of meter

Digital Output Cards



The *Digital Output Card* Default Control Panel allows users to configure, control and monitor a *Digital Output Card.*

Clock Source



Clock Source allows the digital outputs per Digital Output Card to be synchronised to the following variety of clock sources: -

- Internal 44.1kHz
- Internal 48kHz
- External 44.1kHz/48kHz 75Ω Terminated
- External 44.1kHz/48kHz High Impedance
- Digital Card A, Channels 1 and 2
- Digital Card B, Channels 1 and 2
- Digital Card C, Channels 1 and 2
- Digital Card D, Channels 1 and 2

Internal

The main board of the Soundweb London device clocks at 48 kHz or 96 kHz. The internal clock is used for the DSPs and any analogue cards fitted. Internal clocks are derived from these frequencies to provide 44.1 kHz or 48 kHz sources. A 1x or 2x multiple of the internal clock can be output. So to obtain, for example, a 96 kHz output, a user would select *Internal 48 kHz* (2 x 48 kHz = 96 kHz).

Note: Since the clock source is specified per digital card, it is not possible to output 44.1 kHz on one output pair and 48 kHz on the other. However, this can be achieved using more than one Digital Output Card.

External

The Digital Output Card will lock to the rate of the external clock source providing it is 44.1 kHz or 48 kHz. There are two external inputs, one is 75 ohm terminated and the other is high impedance.

Note: The external clock source frequency is not measured by the digital output card so is always labelled 44.1 kHz / 48 kHz. The user is responsible for ensuring that the external clock frequency is correct.

The output clock frequency of a digital card is a 1x or 2x multiple of the input clock frequency. To output an 88.2 kHz audio signal the external source clock frequency must be 44.1 kHz.

Note: If, for example, the external clock frequency drifts up to 48 kHz, the output would drift to 96 kHz, even though the indicated Output Sample Rate is set to 88.2 kHz.

If an external clock frequency is selected but no clock is present, the Status will indicate '*Warning: not locked*'.

Digital Card

Sync to another digital card requires that the **SyncBus** is fitted.

Digital Output Cards can be synced to any other digital card, input (channels 1&2) or output.

There are a number of invalid conditions which are detected and the status displayed appropriately. These errors are described under the **Status Indicator** heading in the **Digital Output Card** section.

Note: In the case that an error is displayed, the output clock will be suppressed resulting in no audio being output from that channel pair.

Source Sample Rate

Source Sample Rate shows the current *Source Sample Rate* per Digital Output Card.

Possible values are: -

- 32 kHz
- 44.1 kHz
- 48 kHz
- 88.2 kHz
- 96 kHz
- 44.1 kHz / 48 kHz
- Not Locked

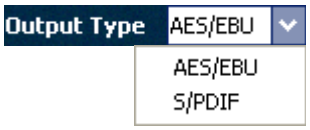
If the clock is locked, the *Source Sample Rate* will show the following: -

- Synced to an internal clock
  - either 44.1 kHz or 48 kHz (matching the selected clock source)
- Synced to an external clock
  - 44.1 kHz / 48 kHz (indicating that only those two frequencies are valid)
- Synced to an input card
  - 32 kHz to 96 kHz (matching the input sample rate of channels 1&2)
- Synced to an output card
  - 44.1 kHz to 96 kHz (matching the output sample rate of channels 1&2)

The *Source Sample Rate* will show '*Not Locked*' in the following conditions: -

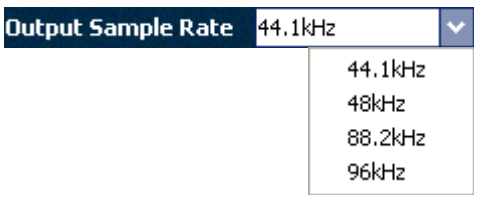
- Synced to an external clock and no clock present
- Synced to a digital input card which is itself not locked
- Synced to a digital output card which is itself not locked for any reason

Output Type



Output Type allows AES/EBU or S/PDIF digital outputs to be selected per stereo signal.

Output Sample Rate



Output Sample Rate allows the output sample rate to be selected per stereo signal.

Bypass Sample Rate Conversion

Bypass Sample Rate Conversion allows the signal to bypass the sample rate conversion per stereo signal in order to improve audio quality for matched sample rates.

Note: For trouble-free operation of Bypass Sample Rate Conversion, the external clock must be the same sample rate as the device; either 48 kHz or 96 kHz and ultimately locked to the same clock source. If the clocks are not locked drift may occur, resulting in audible clicks.

Status Indicator

The *Status Indicator* shows one of the following conditions: -

- Locked
- Warning: Not Locked
- Error: Attempted sync to self[1]
- Error: Attempted sync to analogue card[2]
- Error: Attempted sync to empty slot[3]
- Error: Incompatible source/sample rate[4]
- Error: Attempted sync loop[5]

Error Conditions

[1]This nonsensical setting is detected.

[2]Analogue cards do not provide a clock signal so an attempt to sync to an analogue card will not work.

[3]Only other digital cards can provide a clock source.

[4]Shown when the requested output sample rate is not a multiple of the source sample rate. When this is displayed the output signal is also suppressed. For example, if the clock source is set to Internal 48 kHz and the Output Sample Rate set to 44.1 kHz, this error will be displayed.

Note: If the card is locked to an external clock, indicated as 44.1 kHz / 48 kHz the card can not detect if the source and output are compatible. So if the user connects a 44.1 kHz external clock and selects a 48 kHz output, the actual output will be 44.1 kHz, and no incompatible status message will be displayed.

If a digital output card is locked to a digital input card that is receiving a 32 kHz signal, the incompatible message will display whatever output sample rate is selected.

If a digital output card is locked to a digital input card that is not locked, or out of range, the incompatible message will display.

[5]If, for example, digital card A is synced to digital card B which is synced to digital card A there is a sync loop. Up to 4 cards can be synced in a circular fashion. All cards involved will display the sync loop status message. A card that is synced to a digital output card that is synced to self will also display the sync loop status message.

Indicator Colouring

- **Green** – Correct functionality
- **Orange** – Warning condition, cause should be investigated
- **Red** – Error condition, output signal suppressed (user intervention required)

Output Meter

The *Output Meter* gives clear output channel metering and offers the following ballistics properties: -

- Attack – attack rate (or speed) of meter
- Release – release rate (or speed) of meter
- Reference – 0dB reference point of meter