

Chapter 3 ❖ Specifications, Pinouts and Schematics

Specifications

General

| | |
|-----------------------|--|
| Dimensions | 7.1L x 3.74H inches |
| Weight | 9 ounces |
| Operating Temp | 0° C to 70° C |
| Power | 1A @ +5V, 300 mA @ +12V, 70mA @ -12V |

Analog Signal Quality

| | |
|-------------------------------|--|
| A/D Conversion | ▪ 20-bit, oversampling sigma delta |
| Crosstalk | ▪ -88 dB @ 1 kHz, input to output |
| D/A Conversion | ▪ 20-bit, oversampling sigma delta |
| Dynamic Range | ▪ 96 dB typical from 20 - 20 kHz, input to output, A weighted ▪ 94 dB minimum from 20 - 20 kHz, input to output, A weighted |
| Frequency Response | ▪ 20 Hz - 20 kHz, ±0.5 dB, input to output |
| Measurement Conditions | ▪ 48 kHz sample rate ▪ -1.0 dB full scale signal amplitude ▪ 22 - 22 kHz measurement bandwidth on an Audio Precision |
| THD+N | ▪ 0.003% typical at 1 kHz, input or output, A weighted ▪ 0.005% maximum at 1 kHz, input or output, A weighted |

Audio Input / Output

Listed below are the input specifications for the Balanced Line, Unbalanced Line, and the Digital Line.

| | Balanced Line | Unbalanced Line | Digital Line (BX44) |
|------------------------|--|--|--|
| Recording Level | +4 dBu nom. + 24 dBu max. | -10 dBV nom. +10 dBV max. | |
| Input Impedance | 24 k ohms | 12 k ohms | |
| Pro Format | | | <ul style="list-style-type: none"> ▪ AES/EBU ▪ EIAJ CP-340 Type I/IE-958 ▪ 110Ω |
| Consumer Format | | | <ul style="list-style-type: none"> ▪ S/PDIF ▪ EIAJ CP-340 TYPE II/EC-958 ▪ 75Ω |
| Connection | <ul style="list-style-type: none"> ▪ 25-pin male D connector, or ▪ female XLR on optional breakout cable | <ul style="list-style-type: none"> ▪ 25-pin male D connector, or ▪ female XLR on optional breakout cable | <ul style="list-style-type: none"> ▪ 15-pin female D connector, or ▪ female XLR on optional breakout cable |

Listed below are the output specifications for the Balanced Line, Unbalanced Line, and the Digital Line.

| | Balanced Line | Unbalanced Line | Digital Line (BX44) |
|-------------------------|--|--|--|
| Drive Level | +4 dBu nom. + 24 dBu max. | -10 dBV nom. +10 dBV max. | |
| Output Impedance | 100 ohms | 50 ohms | |
| Load Impedance | 600 ohms or greater | 600 ohms or greater | |
| Pro Format | | | <ul style="list-style-type: none"> ▪ AES/EBU ▪ EIAJ CP-340 Type I/IE-958 ▪ 110Ω |
| Consumer Format | | | <ul style="list-style-type: none"> ▪ S/PDIF ▪ EIAJ CP-340 TYPE II/EC-958 ▪ 75Ω |
| Connection | <ul style="list-style-type: none"> ▪ 25-pin male D connector, or ▪ female XLR on optional breakout cable | <ul style="list-style-type: none"> ▪ 25-pin male D connector, or ▪ female XLR on optional breakout cable | <ul style="list-style-type: none"> ▪ 15-pin female D connector, or ▪ female XLR on optional breakout cable |

External Bracket Connectors

Listed below are the specifications for both the external 25-pin male and 15-pin female connectors. The 15 pin connector is available only on the SC22 and BX44 cards.

| | |
|------------------------|---|
| 25-pin Male D | <ul style="list-style-type: none"> ▪ Audio inputs (4) / Female XLR on 4-channel analog I/O cable ▪ Audio outputs (4) / Male XLR on 4-channel analog I/O cable |
| 15-pin Female D | <ul style="list-style-type: none"> ▪ AES/EBU and S/PDIF input / Female XLR on optional digital I/O cable (DIOC) ▪ AES/EBU and S/PDIF output / Male XLR on DIOC ▪ LTC I/O / Female RCA (2) on DIOC ▪ MIDI I/O / Female 5-pin DIN (2) on DIOC ▪ External TTL clock input / Female BNC on DOC |

Internal Connections

The following connections are available on board-mounted SMB connectors of the SC22 and BX44 cards.

| | |
|-------------------------------|--|
| Internal Clock Input | TTL compatible input used for synchronization in multiple-card systems |
| Internal Clock Output | TTL compatible output used for synchronization in multiple-card systems and as an external clock output when used with optional video cable assembly |
| Composite Video Input | <ul style="list-style-type: none"> ▪ Input to VITC reader and horizontal sync extractor for genlocking ▪ 75 ohm or 20 k ohm impedance; 1 V p-p nominal level |
| Composite Video Output | <ul style="list-style-type: none"> ▪ Output from VITC generator or loop-through from video input ▪ 75 ohm impedance; 1 V p-p nominal level |

Memory

| | |
|----------------------|---|
| DSP Program | 32 x 32 k zero wait state SRAM |
| PC/DSP Shared | 32 x 32 k zero wait state SRAM (data packet size: 2K bytes) |

MIDI Interface (BX44 only)

The MIDI interface is buffered with hardware time stamping.

| | |
|---------------------|-------------------------|
| Input Buffer | 128 bytes |
| Connections | Optoisolated IN and OUT |

PC Interface

Audio card PC interface is a 32-bit PCI.

| | |
|------------------|--|
| Data Path | Memory-mapped buffers for audio data and messaging |
|------------------|--|

Sample Clock Generator

The sample clock generator is a low-jitter, phase-locked-loop frequency synthesizer.

| | |
|--------------------------------|---|
| Reference Clock Sources | <ul style="list-style-type: none">▪ On-board oscillator▪ Digital input▪ External TTL clock▪ Internal TTL clock▪ NTSC or PAL composite video |
| PLL Control Sources | <ul style="list-style-type: none">▪ Host computer, SMPTE, MTC |
| Sample Rates | <ul style="list-style-type: none">▪ Variable from 10.6kHz 50 kHz |
| External Clock Rates | <ul style="list-style-type: none">▪ 24 kHz - 48 kHz word clocks▪ 24 kHz - 54 MHz non-word clocks |

Signal Processor

| | |
|----------------|---|
| Type | <ul style="list-style-type: none">▪ 40-80 MHz TMS320C31 floating-point DSP |
| Tasks | <ul style="list-style-type: none">▪ Real-time data mixing and movement▪ PC messaging▪ System resource control (A/D, D/A digital I/O, MIDI, SMPTE) |
| Options | <ul style="list-style-type: none">▪ SPx® header |

SMPTE Interface (SC22 and BX44)

| | |
|-------------------------|--|
| Type | <ul style="list-style-type: none"> ▪ LTC receiver and generator ▪ VITC receiver and generator with screen burner ▪ SMPTE to MTC converter |
| LTC Input Level | <ul style="list-style-type: none"> ▪ 0.1 - 10 V p-p, balanced ▪ 0.1 - 5 V p-p, unbalanced |
| LTC Output Level | <ul style="list-style-type: none"> ▪ -27 dBV to +6 dBV, adjustable in 3 dB increments |
| Frame Rates | <ul style="list-style-type: none"> ▪ 30 Hz, 29.97 Hz (NTSC) ▪ 25 Hz PAL, 24 Hz (film) |
| Frame Modes | <ul style="list-style-type: none"> ▪ Drop frame and non-drop frame |
| Sync Rates | <ul style="list-style-type: none"> ▪ 1/30 to 80 times normal rate |

I/O Port Pinouts and Cable Schematics

Balanced Analog I/O Port Pinouts

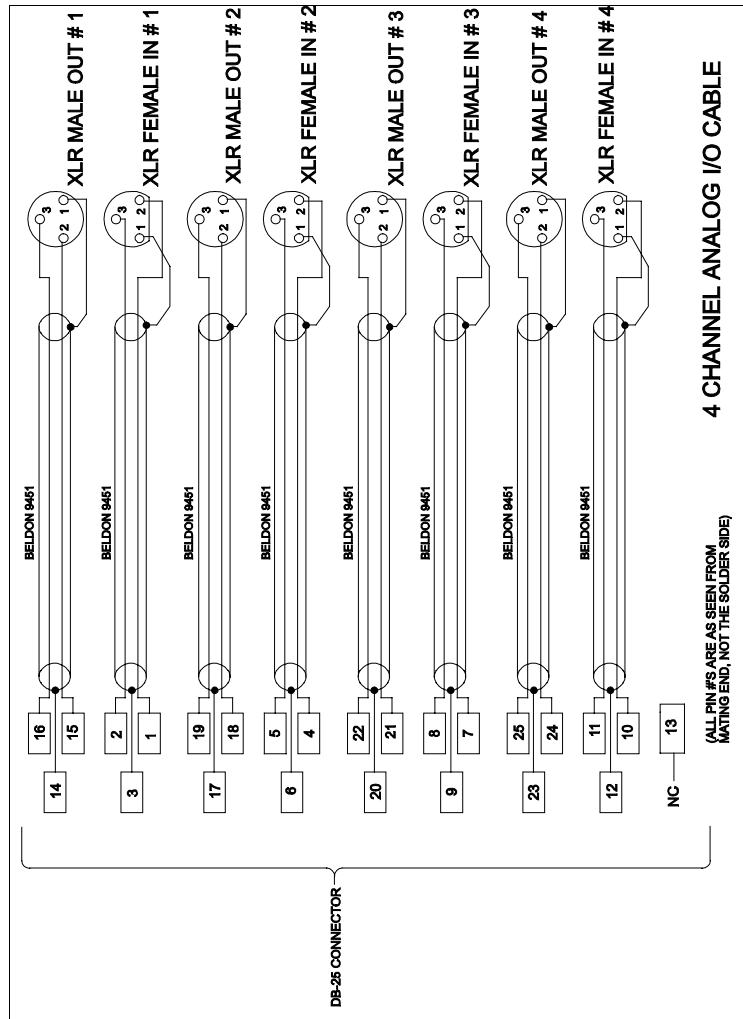
The pinout for the 4in/4out balanced I/O port is shown in the table below. Each input and output has a hot (+) and a cold (-) signal. Multiple ground pins are provided to simplify cabling. All ground pins are wired to the computer's chassis ground. Cards with less than 4in/4out use the lowest numbered inputs and outputs.

| Pin | Description | Pin | Description |
|-----|---------------------|-----|----------------------|
| 1 | Channel 1 input (+) | 14 | Ground |
| 2 | Channel 1 input (-) | 15 | Channel 1 output (+) |
| 3 | Ground | 16 | Channel 1 output (-) |
| 4 | Channel 2 input (+) | 17 | Ground |
| 5 | Channel 2 input (-) | 18 | Channel 2 output (+) |
| 6 | Ground | 19 | Channel 2 output (-) |
| 7 | Channel input 3 (+) | 20 | Ground |
| 8 | Channel input 3 (-) | 21 | Channel output 3 (+) |
| 9 | Ground | 22 | Channel output 3 (-) |
| 10 | Channel 4 input (+) | 23 | Ground |
| 11 | Channel 4 input (-) | 24 | Channel 4 output (+) |
| 12 | Ground | 25 | Channel 4 output (-) |
| 13 | No Connect | | |

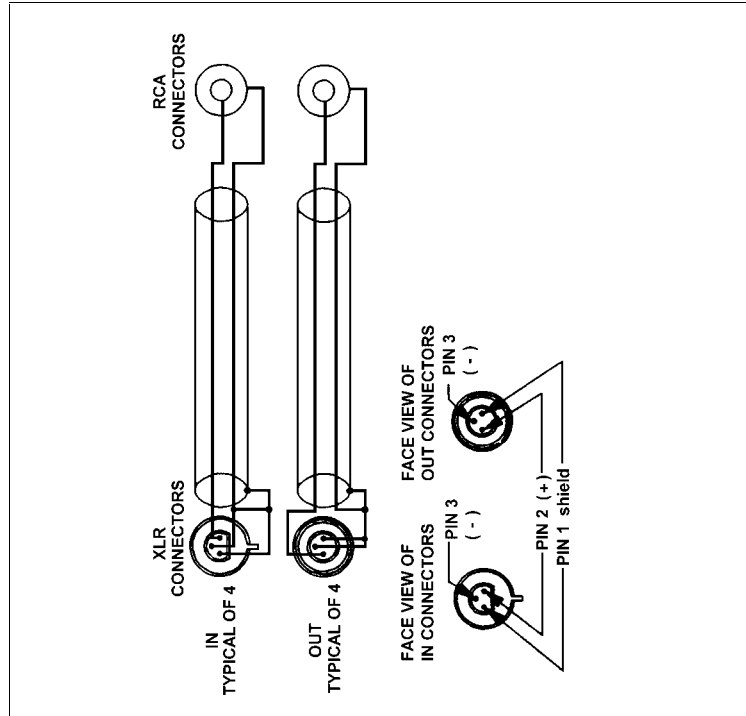
Note

Unbalanced connections are made to the balanced I/O port by grounding of the (-) signal and using the (+) signal. If the (-) signal is not grounded, the signal level of the (+) side will be inaccurate.

Four-Channel Balanced Analog I/O Cable Schematic (210-0382). Other Cables Similar.



Balanced-to-Singled-Ended Adapter Schematic



Digital I/O and Sync Port Pinouts

The pinout for the digital I/O port is shown in the table below. All ground pins are wired to the computer's chassis ground.

| Pin | Description |
|-----|--------------------------|
| 1 | External clock input |
| 2 | Digital audio output (+) |
| 3 | MIDI output (+) |
| 4 | MIDI input (+) |
| 5 | SMPTE (LTC) input (+) |
| 6 | Ground |
| 7 | Digital audio input (+) |
| 8 | Ground |
| 9 | MIDI output (-) |
| 10 | Ground |
| 11 | Digital audio input (-) |
| 12 | Digital audio output (-) |
| 13 | SMPTE (LTC) output |
| 14 | MIDI input (-) |
| 15 | SMPTE (LTC) input (-) |

Digital I/O Cable Schematic

