

QUANSER DS1104 INTERFACE BOARD

REFERENCE GUIDE



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QUANSER DS1104 INTERFACE BOARD

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General information

Quanser DS1104 Interface Board User's Manual

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OVERVIEW

Quanser DS1104 Interface Board provide easy connect interface to most of Quanser's experiment modules.

The Quanser DS1104 Interface Board(QIB) is equipped with the following connectors:

- RCA Connectors for eight A/D channels and eight D/A channels.
- DIN5 Connectors for two single ended Encoder inputs (Compatible with Quanser Experiment modules).
- 2x5 protected headers for two Differential Encoder inputs.
- 20 I/O available on two 2x10 protected headers.
- 2x5 protected header for RS-232 and RS442/485.
- 2x5 protected header J6 for Serial Peripheral Interface(SPI) and Capture Inputs
- 2x5 protected header J8 for non-inverted and inverted 3 phase PWM outputs
- 2x5 protected header J9 for single phase PWM outputs.
- 1 Amp Fuse for DS1104 overload protection and LED for Encoder Power indication. *Note: Use only 1 Amp fuse.*

See Figure (2) for connector locations.

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A/D INTERFACE

Please refer to the DS1104 user guide for A/D specifications.

Quanser DS1104 Interface board (QIB) provides 8 A/D channels with on-board RC low-pass filtering. The footprints for the RC low-pass filtering components are provided to allow users to configure all A/D signals for front end low-pass filtering before feeding to the DS1104 data acquisition board. See Figure (1). The QIB is not supplied with the RC components.

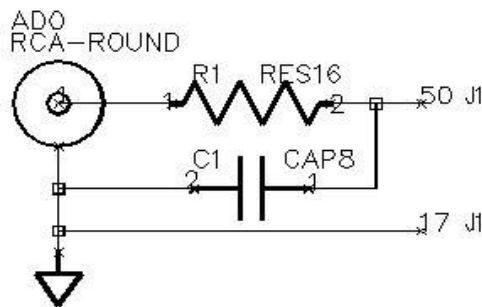


Figure 1: A/D RC Low-pass Filter circuit

Table (1) summarizes the A/D channels with corresponding signal names and Sub-D pin locations.

A/D Channel	Sub-D Pin	Pin on QIB	Signal
Ch 1	P1A 50	AD0	ADCH1
Ch 2	P1B 50	AD1	ADCH2
Ch 3	P1A 33	AD2	ADCH3
Ch 4	P1B 33	AD3	ADCH5
Ch 5	P1A 16	AD4	ADCH5
Ch 6	P1B 16	AD5	ADCH6
Ch 7	P1A 48	AD6	ADCH7
Ch 8	P1B 48	AD7	ADCH8

Table 1: A/D channels and corresponding DS1104 signals

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D/A INTERFACE

Please refer to the DS1104 user guide for D/A specifications.

Quanser DS1104 Interface board (QIB) provides 8 D/A channels with easy connect RCA connectors. Table (2) summarizes the A/D channels with corresponding signal names and Sub-D pin locations.

D/A Channel	Sub-D Pin	Pin on QIB	Signal
Ch 1	P1A 31	DA0	DACH1
Ch 2	P1B 31	DA1	DACH2
Ch 3	P1A 14	DA2	DACH3
Ch 4	P1B 14	DA3	DACH5
Ch 5	P1A 46	DA4	DACH5
Ch 6	P1B 46	DA5	DACH6
Ch 7	P1A 29	DA6	DACH7
Ch 8	P1B 48	DA7	DACH8

Table 2: D/A channels and corresponding DS1104 signals

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DIGITAL I/O INTERFACE

Please refer to the DS1104 user guide for Digital I/O specifications.

Quanser DS1104 Interface board (QIB) provides access to 20 digital I/Os available on headers J10 and J5. Table (3) summarizes the digital I/Os bits with corresponding signal names and Sub-D pin locations.

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D/A Channel	Sub-D Pin	Pin on QIB	Signal
Bit 0	P1A 12	J10 1 DI0	IO0
Bit 1	P1B 12	J10 2 DI1	IO1
Bit 2	P1A 28	J10 3 DI2	IO2
Bit 3	P1B 28	J10 4 DI3	IO3
Bit 4	P1A 44	J10 5 DI4	IO4
Bit 5	P1B 44	J10 6 DI5	IO5
Bit 6	P1A 11	J10 7 DI6	IO6
Bit 7	P1B 11	J10 8 DI7	IO7
Bit 8	P1A 27	J10 9 DI8	IO8
Bit 9	P1B 27	J10 10 DI9	IO9
Bit 10	P1A 43	J5 1 DI0	IO10
Bit 11	P1B 43	J5 2 DI1	IO11
Bit 12	P1A 10	J5 3 DI2	IO12
Bit 13	P1B 10	J5 4 DI3	IO13
Bit 14	P1A 26	J5 5 DI4	IO14
Bit 15	P1B 26	J5 6 DI5	IO15
Bit 16	P1A 42	J5 7 DI6	IO16
Bit 17	P1B 42	J5 8 DI7	IO17
Bit 18	P1A 9	J5 9 DI8	IO18
Bit 19	P1B 9	J5 10 DI0	IO19

Table 3: Digital I/Os and corresponding DS1104 signals

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RS232 AND RS485/422

Please refer to the DS1104 user guide for RS232 and RS485/422 specifications.

Quanser DS1104 Interface board (QIB) provides access to all RS232 and RS485/422 signals on header J7. Table (4) summarizes the DB-9 pin locations for RS232 with corresponding signal names and Sub-D pin locations.

Pin on DB-9	Sub-D Pin	Pin on QIB	RS-232	RS485/422
5	P1A 1	J7 1, 2	GND	GND
2	P1B 35	J7 5	RxD	/RxD
3	P1A 35	J7 7	TxD	/TxD
4	P1A 2	J7 9	DTR	TxD
6	P1B 2	J7 4	DSR	RxD
7	P1A 18	J7 6	RTS	/RTS
8	P1A 18	J7 8	CTS	/CTS
1	P1B 34	J7 3	DCD	CTS
N/A	P1A 29	J7 10	N/A	RTS

Table 4: DB-9 RS232 pin locations and corresponding DS1104 signals

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SERIAL PERIPHERAL INTERFACE AND CAPTURE

Please refer to the DS1104 user guide for Capture and SPI specifications.

Quanser DS1104 Interface board (QIB) provides access Capture and Serial Peripheral Interface signals on header J6. Table (5) summarizes Capture and SPI pins with corresponding signal names and Sub-D pin locations.

Channel	Sub-D Pin	Pin on QIB	Signal
Capture	P1A 19	J6 10	SSCLK
	P1A 3	J6 8	SSTE
	P1A 36	J6 6	SSOMO
	P1A 20	J6 4	SSOMI
	P1A 1	J6 2	GND
SPI	P1B 19	J6 9	SCAP1
	P1B 3	J6 7	SCAP2
	P1B 36	J6 5	SCAP3
	P1B 20	J6 3	SCAP4
	P1A 1	J6 1	GND

Table 5: SPI and Capture with corresponding DS1104 signals

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DIFFERENTIAL ENCODERS

Please refer to the DS1104 user guide for Differential Encoder specifications.

Quanser DS1104 Interface board (QIB) provides access two differential encoder signals on headers J3 and J4. Table (6) summarizes the Differential Encoder pins with corresponding signal names and Sub-D pin locations.

Channel	Sub-D Pin	Pin on QIB	Signal
Ch1	P1A 41	J3 5	PHI0
	P1A 8	J3 8	/PHI0
	P1A 24	J3 9	PHI90
	P1A 40	J3 10	/PHI90
	P1A 7	J3 3	IDX
	P1A 23	J3 4	/IDX
	P1A 1	J3 1, 2	GND
	+5V	J3 7,8	VCC
Ch2	P1B 41	J4 5	PHI0
	P1B 8	J4 8	/PHI0
	P1B 24	J4 9	PHI90
	P1B 40	J4 10	/PHI90
	P1B 7	J4 3	IDX
	P1B 23	J4 4	/IDX
	P1B 1	J4 1, 2	GND
	+5V	J4 7,8	VCC

Table 6: Differential Encoders channels with corresponding DS1104 signals

Note: The DS1104 board is fuse protected. Before using the Encoders make sure the LED is ON. The LED is a +5V indicator.

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SINGLE-ENDED ENCODERS

Please refer to the DS1104 user guide for Differential Encoder specifications.

Quanser DS1104 Interface board (QIB) provides access two single-ended encoder signals on DIN connectors ENC1 and ENC2. Table (7) summarizes the single-ended Encoder pins with corresponding signal names and Sub-D pin locations.

Note: The DS1104 board is fuse protected. Before using the Encoders make sure the LED is ON. The LED is a +5V indicator. Use only 1 Amp fuse.

Channel	Sub-D Pin	Pin on QIB	Signal
Ch1	P1A 41	ENC1 5	PHI0
	P1A 24	ENC1 4	PHI90
	P1A 7	ENC1 3	IDX
	P1A 1	ENC1 1, 6	GND
	+5V	ENC1 2	VCC
Ch2	P1B 41	ENC2 5	PHI0
	P1B 24	ENC2 4	PHI90
	P1B 7	ENC2 3	IDX
	P1B 1	ENC2 1, 6	GND
	+5V	ENC2 2	VCC

Table 7: Single-ended Encoder channels with corresponding DS1104 signals

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3-PHASE PWM OUTPUT

Please refer to the DS1104 user guide for 3-phase PWM output specifications.

Quanser DS1104 Interface board (QIB) provides access 3-phase PWM inverting and non-inverting output signals on header J8. Table (8) summarizes the 3-phase PWM output signals with corresponding signal names and Sub-D pin locations.

Phase	Sub-D Pin	Pin on QIB	Signal
1 (Non-inverted)	P1A 6	J8 3	SPWM1
2 (Non-inverted)	P1A 38	J8 5	SPWM3
3 (Non-inverted)	P1A 21	J8 7	SPWM5
GND	P1A 1	J8 1, 9	GND
1 (Inverted)	P1A 22	J8 4	SPWM2
2 (Inverted)	P1A 5	J8 6	SPWM4
3 (Inverted)	P1A 37	J8 8	SPWM6
GND	P1B 1	J8 2, 10	GND

Table 8: 3-Phase PWM Outputs with corresponding DS1104 signals

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SINGLE PHASE PWM OUTPUTS

Please refer to the DS1104 user guide for single phase PWM output specifications.

Quanser DS1104 Interface board (QIB) provides access single phase PWM output signals on header J9. Table (9) summarizes the single phase PWM output signals with corresponding signal names and Sub-D pin locations.

PWM Channel	Sub-D Pin	Pin on QIB	Signal
Ch 1	P1B 21	J9 1	ST2PWM
Ch 2	P1B 6	J9 3	SPWM7
Ch 3	P1B 22	J9 5	SPWM8
Ch 4	P1B 38	J9 7	SPWM9
	P1B 1	J9 2,4,6,8	GND

Table 9: Single Phase PWM Outputs with corresponding DS1104 signals

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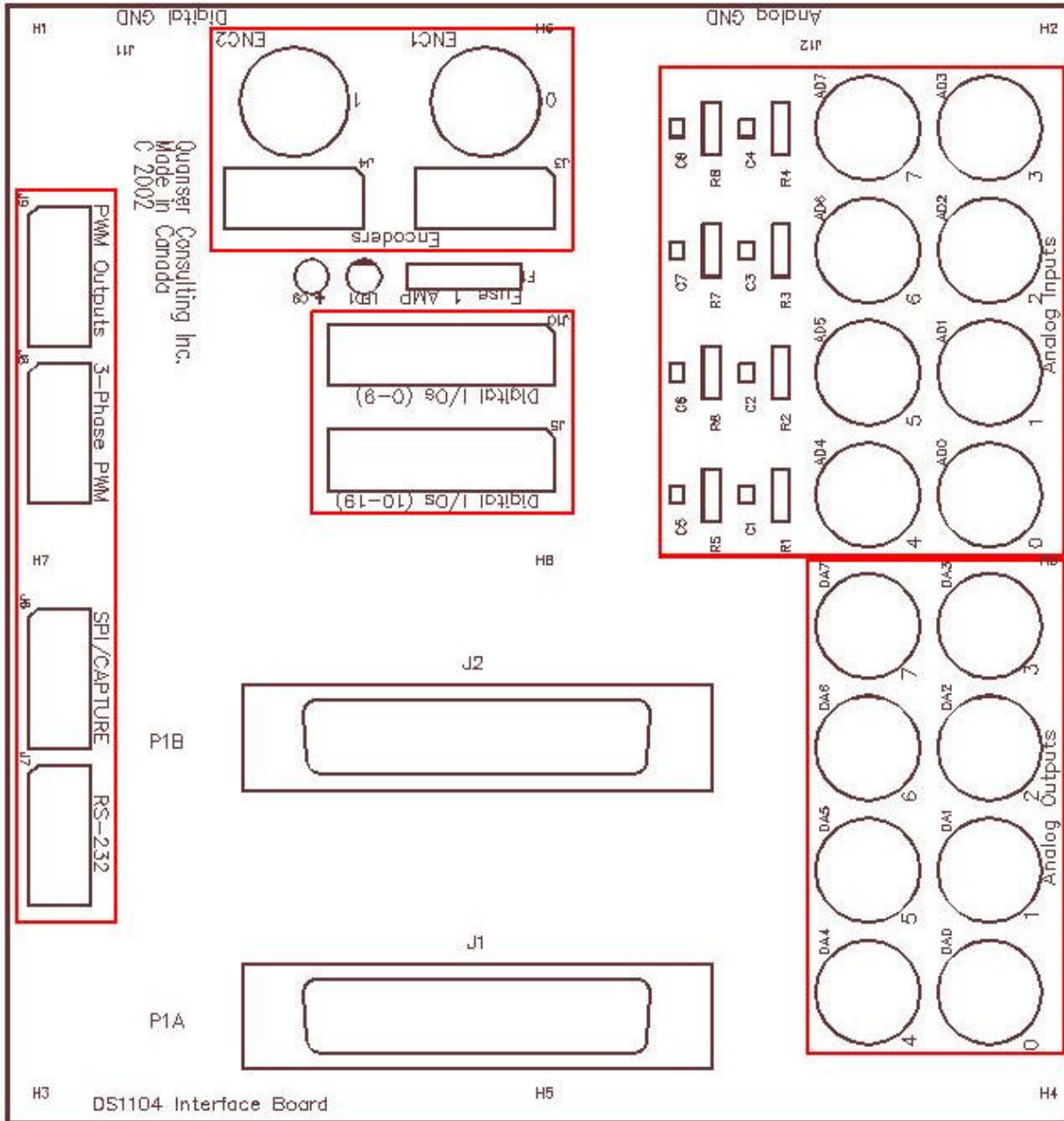


Figure 2: Quanser DS1104 Interface board connector locations