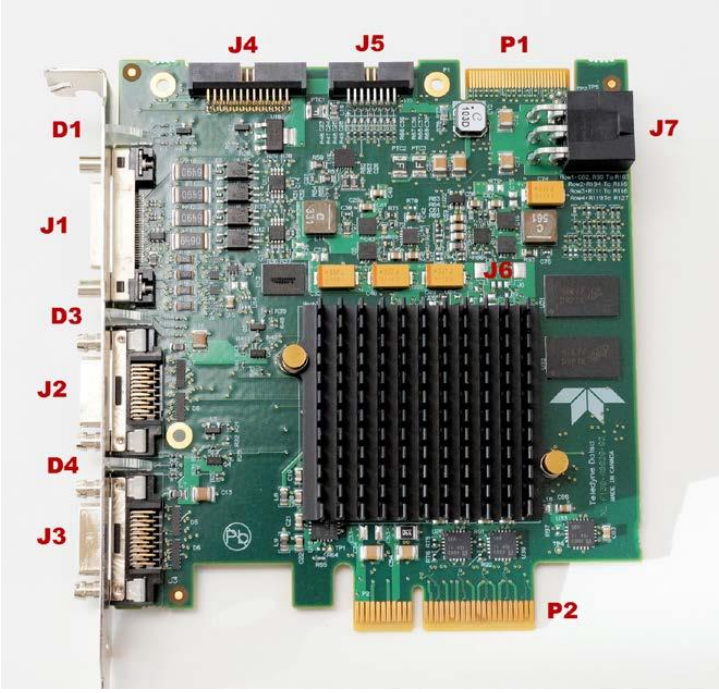
Xtium-CL MX4 Frame Grabber Triggering Notes:
On the MX4, there is a 27-pin J1 connector on the outside of the card, and an internal 26-pin J4 connector. They both have the same pinout assignment for the first 26 pins. Use shaft encoder phase A for line trigger and external trigger input 1 for frame trigger.



Connector / LED Description List

The following table lists components on the Xtium-CL MX4 board. Detailed information concerning the connectors/LEDs follows this summary table.

Location	Description	Location	Description
J1	External Signals connector DH60-27P	J5	Multi Board Sync
J2	Camera Link 2 Connector	J7	PC power to camera interface and/or J1
J3	Camera Link 1 Connector	D1	Boot-up/PCIe Status LED (refer to text)
P2	PCIe x4 computer bus connector (Gen2 compliant slot preferred)	D3, D4	Camera status LEDs
J4	Internal I/O Signals connector (26-pin SHF-113-01-L-D-RA)	J6, P1	Reserved

Table 25: Board Connector List

The full description of pinout and best practices is in the MX4 manual. You can use either, both, more, or neither trigger inputs depending on the application. Some pinouts and practices will vary depending on the revision of the board.

Pin 8 is External trigger input 1+ and pin 7 is external input 1-. We use a single ended frame trigger signal that goes to pin 8 for signal and pin 7 for ground, but it also supports differential input.
Pin 3 is the shaft encoder phase A+, 2 is A-, and 1 is GND. We use a single ended line trigger signal connected to pin 3 A+ for signal, and pin 1 for GND. Rev B0 of the MX4 natively supports directly connecting TTL shaft encoder signals to RS-422(+) input without biasing the RS-422(-).

Xtium-CL MX4 rev. B0

Description	Pin #	Pin #	Description
Ground	1	15	General Input 3 (+)
RS-422 Shaft Encoder Phase A (-)	2	16	General Input 4 (+)
TTL/RS-422 Shaft Encoder Phase A (+) (see note 3)	3	17	General Input 4 (-)
Ground	4	18	General Input 3 (-)
RS-422 Shaft Encoder Phase B (-)	5	19	Power Output 5 Volts, 100mA max
TTL/RS-422 Shaft Encoder Phase B (+)	6	20	External Trigger Input 2 or General Input 2 (-)
External Trigger Input 1/General Input 1 (-)	7	21	General Output 3
External Trigger Input 1/General Input 1 (+)	8	22	General Output 4
External Trigger Input 2/General Input 2 (+)	9	23	General Output 5
Ground	10	24	General Output 6
Strobe 1 / General Output 1 (See note 2)	11	25	General Output 7
Strobe 2 / General Output 2 (See note 2)	12	26	General Output 8
Ground	13	27	NC
Power Output 12 Volts, 350mA max *(from Aux Power Connector, see J7)*	14		

Note 3.5: Interfacing directly to a TTL (also called Push-Pull) Output (Rev B Only)

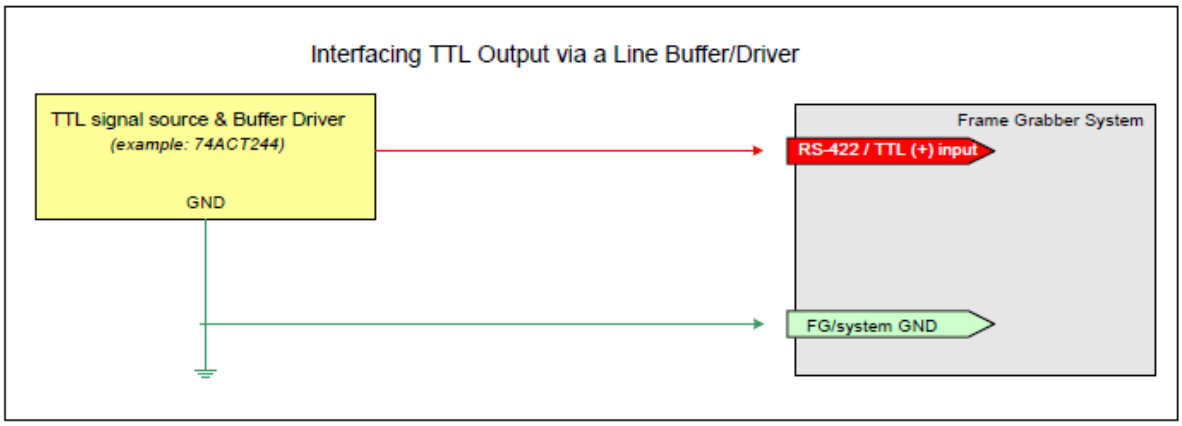


Figure 39: Interfacing TTL to TTL Shaft Encoder Inputs

- NOTE: User must select the Shaft Encoder TTL level when using this mode (CORACQ_PRM_SHAFT_ENCODER_LEVEL = CORACQ_VAL_LEVEL_TTL (0x1)).

For single ended TTL line trigger signals on a Rev A2 board and below, a bias voltage of about two volts should be placed on the pin2 A- since the shaft encoder inputs are not optocoupled and guarantees the correct detection of the single ended signal.

Note 3.2: Interfacing to a TTL (also called Push-Pull) Output

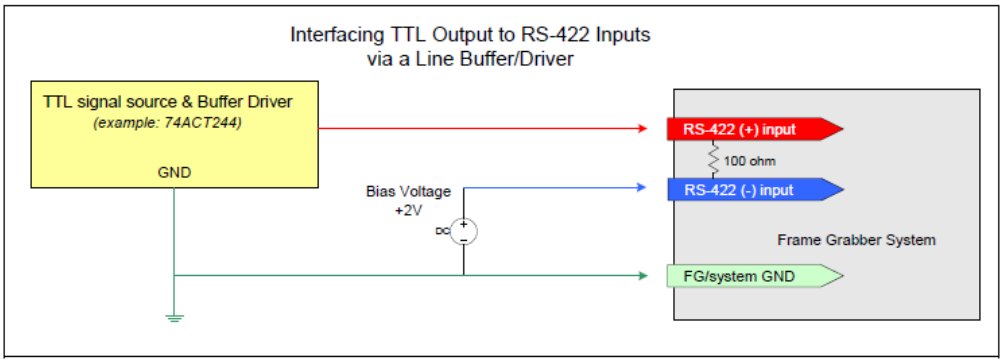


Figure 33: Interfacing TTL to RS-422 Shaft Encoder Inputs

- The graphic shows a single-ended driver signal interfaced to the RS-422 input.
- RS-422 (-) input is biased to a DC voltage of +2 volts.
- This guarantees that the TTL signal connected to the RS-422 (+) input will be detected as a logic high or low relative to the (-) input.
- The TTL shaft encoder ground, the bias voltage ground, and the Xtium-CL MX4 computer system ground must be connected together.
- DC voltage for the RS-422 (-) input can be generated by a resister voltage divider.
- Use a single battery cell if this is more suitable to your system.

Xtium-CL MX4 rev. A2

Description	Pin #	Pin #	Description
Ground	1	15	General Input 3 (+)
RS-422 Shaft Encoder Phase A (-)	2	16	General Input 4 (+)
RS-422 Shaft Encoder Phase A (+) (see note 3)	3	17	General Input 4 (-)
Ground	4	18	General Input 3 (-)
RS-422 Shaft Encoder Phase B (-)	5	19	Power Output 5 Volts, 100mA max
RS-422 Shaft Encoder Phase B (+)	6	20	External Trigger Input 2 or General Input 2 (-)
External Trigger Input 1/General Input 1 (-)	7	21	General Output 3
External Trigger Input 1/General Input 1 (+)	8	22	General Output 4
External Trigger Input 2/General Input 2 (+)	9	23	General Output 5
Ground	10	24	General Output 6
Strobe 1 / General Output 1 (See note 2)	11	25	General Output 7
Strobe 2 / General Output 2 (See note 2)	12	26	General Output 8
Ground	13	27	NC
Power Output 12 Volts, 350mA max *(from Aux Power Connector, see J7)*	14		

Table 30: MX4 Rev A2: J1 & J4 Connector Signals

Optional Digikey Parts for MX4 IO Signals and Bias Voltage Generation:
DH40-27S plug (H11933-ND) (External IO Connection to J1 for Triggers)
DH-37-CV2B cover (H11931-ND)

Ribbon cable with 26pin connector SAM8786-ND (Internal IO Connection for Bias Voltage)
680 ohm resistor S680HCT-ND
470 ohm resistor S470HCT-ND

Use ribbon cable internally on J4 for the biasing to make wiring of the external connector less complicated.
Wire up 680 and 470 ohm resistor in series. The 470 ohm will drop approx 2V of the source 5V to be used as biasing voltage for shaft encoder A-. (example: pin 19 5v through series resistors to ground pin 1 and then the 2v dropped by the 470 to pin 2)

5V power output is Pin 19
Shaft encoder phase A- is pin 2
Ground is pin 1, 4 , 10, or 13