| EQUAD UP/DOWN CLOCK TO QUADRATURE ENCODER

EQUAD Features

- Simple in-line installation
- Rising or falling edge triggering
- x1 or x4 quadrature mode
- Selectable debounce option

The EQUAD is no longer available for purchase.

EQUAD Product Description

The EQUAD converts any clock source into optical encoder quadrature outputs. When up clock / down clock mode is selected (via DIP SW1), up-clocks generate an A leads B quadrature sequence, and down clocks generate a B leads A quadrature sequence. Alternatively, DIP SW1 may be set for clock and direction inputs; each active edge of the clock input will advance or retard the quadrature output according to the level present on the direction input.

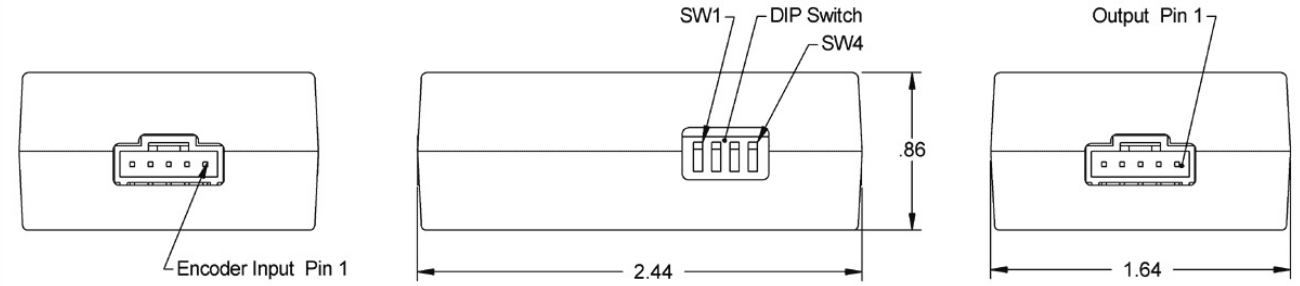
The EQUAD may be placed inline between a clock source, such as a PLC or indexer, and will output TTL quadrature signals in response to rising or falling edges on its inputs. In situations where the clocks are generated by mechanical contacts such as switches or relays, an internal debounce, you can enable digital filtering with the DIP switch to debounce those signals and prevent multiple triggers. The filtering works by not recognizing a clock edge unless the level is stable for 9 milliseconds after the edge. The inputs have 5K Ohm pull-up resistors to +5V. You can drive the inputs with TTL levels or open collector-type outputs. The EQUAD samples its input at the crystal frequency of 3.58 MHz, which allows the circuit to respond to input frequencies more than 800 kHz in 1x mode, and 100 kHz in 4x mode.

Four DIP switches allow the EQUAD to select the input mode, trigger on rising or falling edges, output one or four quadrature state changes per trigger (x1 or x4 mode) and enable or disable the debounce feature.

DIP SW1 selects the input mode, either up clock / down clock or clock/direction. DIP SW2 selects x1 or x4 mode. In x1 mode, a trigger will generate a single quadrature state change. In x4 mode, a single trigger will generate four quadrature state changes (a full encoder cycle). When in the x4 mode, the time period for each state change is 4.47 microseconds (13.4 microseconds for the full cycle). DIP SW3 optionally inverts the inputs so that you may make a falling edge the active edge. DIP SW4 enables the debounce feature.

The EQUAD draws its +5V power from either the input or output connectors. Connectors are 5-pin positive latching. DIN rail mounting is available.

Mechanical Drawings



Specifications

ABSOLUTE MAXIMUM RATINGS

PARAMETER	MIN.	MAX.	UNITS
Storage Temperature	-40	100	C
Operating Temperature	0	70	C
Humidity (non-condensing)	0	95	%
Digital Inputs (diode clamped)	-0.6	5.6	V

ELECTRICAL

PARAMETER	MIN.	TYP.	MAX.	UNITS
Supply Voltage (Vcc)	4.75	5.0	5.25	V
Supply Current		120		mA
Input Low Voltage	0		0.8	V
Input High Voltage	2.0		Vcc	V
Output Low (8mA current sink)			0.4	V
Output High (4mA current source)	2.4			V
Max. Input Frequency - 1x mode			800	kHz
Max. Input Frequency - 4x mode			100	kHz
Max. Phase Delay - Debounce on			2.0	usec.
Max. Phase Delay - Debounce off			9.2	usec.

PIN-OUTS

Input Pin-out:

PIN	DESCRIPTION
1	Ground
2	NC
3	Up clock / clock
4	+5V power (directly connected to pin 4 of Output connector)
5	Down clock / direction

Output Pin-out:

PIN	DESCRIPTION
1	Ground
2	Index (always low)
3	A channel
4	+5V power
5	B channel

DIP SWITCH SETTINGS

SWITCH	DESCRIPTION
1	Input Mode: switch down = up/down clock mode switch up = clock/direction mode
2	Output Quadrature Mode: switch down = x1 quadrature switch up = x4 quadrature
3	Input Clock Polarity: switch down = falling edge triggered switch up = rising edge triggered
4	Input Debounce: switch down = no debounce switch up = 9 millisecond debounce

PRODUCT CHANGE NOTIFICATIONS

Title	Date	Description	Download
PCN 1011	9/21/2011	The AD2B, AD4B, AD7, EADAPT, EDAC2, EDIVIDE, EPOT, EQUAD, ESUM, ESWITCH, ETACH2, SEI-USB, USB-232 currently utilizes a printed thermal transfer label. This label will no longer be used and will be replaced by laser marking directly onto the housing of the product. The purpose for this change is to create a more durable solution, and eliminate the possibility of the label being inadvertently removed from the housing.	Download *(https://www.usdigital.com/support/resources/product-change-notifications/pcn-1011-interface-product-laser-marking/)*
EOL EQUAD - PCN 1025	6/17/2013	This PCN is a formal notification that US Digital is discontinuing the EQUAD.	Download *(https://www.usdigital.com/support/resources/product-change-notifications/pcn-1025-eol-equad/)*

Notes

- Cables and connectors are not included and must be ordered separately.
- US Digital® warrants its products against defects in materials and workmanship for two years. See complete warranty *(https://www.usdigital.com/company/warranty)* for details.