Rotary encoder driver - User Guide v.1

This rotary encoder driver is interrupt driven on all edges of the two quadrature signals. A state machine based on a 16 cell look-up table is used to minimise contact bounce and time spent servicing the interrupts. It was developed for ESP32forth v7.0.5.4.

The driver expects the encoder to be connected as follows:-

Rotary encoder pin	ESP32forth pin
CLK	GPIO4
DT	GPIO15
+	3V3
GND	GND

Other GPIO pins may be used if the pin allocation constants in the driver are changed.

User interface

The driver is contained in vocabulary 'encoder'.

init_encoder (–) must be called once only in your program to assign the GPIO pins and set up the interrupts. In the source code, this word is called once for you, but that can be commented out if it is to be performed elsewhere.

read_count_rel (– count period) read count relative is called repeatedly (e.g. maybe around every 100mS for radio tuning) and returns the number of counts received from the encoder since this word was last called. This allows the speed of rotation to be calculated if required. Count is a signed value, +ve indicates clockwise rotation, -ve is anticlockwise. This is useful for radio tuning, especially where the speed of rotation is made to influence the number of counts apparently received. i.e. The faster the tuning knob is turned, the much larger count is returned. That feature is left up to the user to provide, for now. Execute remove_limits and default_count to set things up, before using read_count_rel

set_limits (min max –) set minimum and maximum count limits when operating in absolute count mode.

remove_limits (–) remove minimum and maximum count limits when operating in absolute count mode.

read_count_abs (--- count) read count absolute returns the absolute count from the variable assigned to deferred word count. This is useful for things like machine tool leadscrew position, where absolute accuracy is needed.

assign_count ("yourvariablename" --) in absolute count mode, set the encoder to control your variable 'yourvariable'

e.g. assign_count myvariable1 would cause myvariable1 to be controlled by the encoder.

default_count (--) reset the variable that the encoder controls to the default ‘counter’ in the encoder vocabulary.

Test words

relcount. (–) is a test word that displays the results from read_count_rel until a key is pressed.

abscount. (–) is a test word that displays the results from read_count_abs until a key is pressed.

Bob Edwards, radio ham G4BBY in SW U.K., wrote this code for ESP32forth v7.0.5.4 in October 2025. Hope you find it useful!