

# Sidus EL

## energy limiter for FAI F1Q class

The Sidus energy limiter (EL) complies with the latest FAI F1Q rules and is compatible with most current F1Q e-timers. It monitors the energy consumed by the motor and once the set energy limit is reached, it issues a signal to the e-timer and keeps monitoring energy until the motor is actually stopped.



### Features

- built-in 3.5mm bullet standard connectors for energy metering
- built-in 4-digit LED display. Directly shows the consumed or programmed energy amount
- built-in ability to set the unit's energy limit using a pushbutton

### Technical data

- Size ..... 27.5 x 38.0 x 6.0 mm
- Weight ..... 6.0 gr
- Voltage range ..... 7.4 to 25.2Vdc (2s to 6s LiPo)
- Current range ..... 3.0 to 65.0 Amps
- Energy range ..... 500 to 2750 Joule in steps of 1 Joule
- Sample rate ..... 100 samples/s
- Internal resistance ..... 500 $\mu\Omega$
- Output signal ..... open-drain negative going 20mS pulse

### HOW IT WORKS

Assuming the limiter is wired as shown below, once powered it will display **CAL** (self-calibration) for about 5 seconds. During this period the unit evaluates the amount of the current flowing to the ESC, e-timer and servo(s) system while the motor is in idle state. Once the self-calibration is completed, the unit briefly flashes the last value for the recorded energy (e.g. **2758**). It then displays the current value (**0000**) for the consumed energy at which point the limiter is ready.

The unit starts accumulating the consumed energy as soon as the e-timer start-switch is released while the motor is running. During energy monitoring the Sidus EL displays the accumulated energy in Joules. When the target energy limit is reached, the limiter signals the e-timer and keeps accumulating extra energy (if any) until the current absorption drops down to 2.5 Amp. Once the energy metering is over, it also displays the motor run. This display remains until the battery is disconnected or if the motor is restarted.

## PROGRAMMING THE CONSUMED ENERGY LIMIT

The energy limit can be set while the unit is in the model and wired as shown below. The programming pushbutton is placed close to the right upper corner of the display.

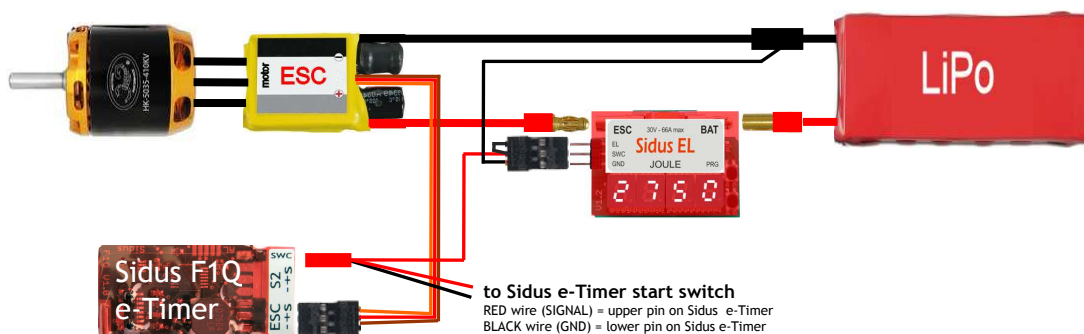
- Connect the battery and wait for the end of the limiter self-calibration (displaying **0000**)
- Press and hold the pushbutton until the unit displays the programmed energy limit (e.g. **2750**), then release it: the programmed amount will flash.
- Press and hold the pushbutton to increment the value quickly, or press and release it multiple times to have increments of 1 Joule. Release the pushbutton a little before getting to the target value and reach it with consecutive small increments. The energy value can only be incremented. Once the maximum legal value (**2750**) is reached it overflows back to **500** Joules.
- Once the target value is reached, release the pushbutton and wait: after about 5 seconds the display will stop flashing and returns to show **0000**, indicating that the new energy limit has been permanently stored in the limiter

### Notes for Sidus F1Q e-timer users

Although the Sidus EL signals the e-timer when the energy allocation has been reached, a motor run should always be set on the e-timer. This handles shorter motor runs (when the energy consumed is less than the energy limit). Even when the model is flown to its full energy allocation, the e-timer's motor run should be set a bit longer, as a safety.

When the set energy limit is reached, the timing on the Sidus e-timer jumps to the programmed motor run cut-off and all the subsequent steps are executed by the e-timer as programmed. This includes the transition from climb to glide and DT. In other words, the Sidus EL's signal just moves the e-timer to begin running from the point the motor was cut off.

### Connection to Sidus e-Timer



### Connection to generic e-Timer

